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A multiregional variable input-output (MRVIO) model is introduced to investigate the impact of a change in transportation costs on regional development and trade flows. The MRVIO model is a theoretically well-founded, practically useful, and policy sensitive model. The regional technical coefficients and the trade coefficients are endogenous variables to the MRVIO model. These coefficients are sensitive to the transportation costs as well as other input costs.

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Each industry is assumed to have a linear logarithm production frontier with a constant return to scale. From the dual relation we obtain the profit maximizing price frontiers. These prices are expressed in terms of transportation costs, wage rates, capital prices, input elasticities, and technical progress parameters. These prices determine the regional technical coefficients and the trade coefficients.

Using the 1963 three-region, ten-sector interindustry flow data as a base, we investigated the impact of a change in transportation costs on trade structure, regional growth, and inflation. As expected, a decrease in transportation cost increases the import coefficients between the regions and decreases own trade coefficients; i.e., the purchases from other regions increase and the purchases from local markets decrease as the costs of transportation decrease. A decrease in transportation cost stimulates the regional development. However, its sensitivity differs among industries.

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Final Report

REGIONAL ECONOMIC DEVELOPMENT IMPACT MODEL: PHASE I STUDY*

By

Chong K. Liew and Chung J. Liew**
The University of Oklahoma

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** Dr. C. K. Liew is Professor of Economics and Director of Econometric Program and Dr. C. J. Liew is an Adjunct Assistant Professor of Economics at the University of Oklahoma.

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Chapter 1

Introduction

(1.1) Objective of the research

The U.S. Army Engineer Institute for Water Resources is conducting an evaluation of the regional, social, economic, and environmental impact of the McClellan-Kerr Arkansas River System. The project, as one of the major U.S. river basin development, was dedicated in early 1971. The system provides navigation, flood control, supply of water and electricity, and recreational facilities for a larger part of Arkansas and Oklahoma. The energy efficient waterway system provides lower cost freight shipment. One of the significant impact measurement problems is to determine the influence of lowered transportation costs on regional economic development. At the same time that the navigation project was being built, an interstate and toll road system was developed paralleling the waterway. This road system improves the trucking access to the waterway.

Since 1971 when the waterway was open for navigation, the system has carried an annual average of 5.26 million tons of freights. The key items are grains, rocks, sand, gravel, iron and steel products, petroleum, coals, and chemical products. The annual shipment by the waterway has steadily increased to reach more than 7 million tons in 1976 from 4.3 million tons in 1971.

The steady increase in freight shipment by the waterway is a reflection of the regional development in the water regions. How much has the waterway contributed to the regional development? This research aims to answer one part of the question. There are many other factors besides the waterway which contribute to the regional development; i.e., Sunbelt movement, construction of highways,

relatively cheaper lands, attractive tax structures, and lower local wage rates. This research separates the net contribution to the regional development by the waterway from the gross contribution by all other factors. The contribution of the waterway may include the construction spending impact, flood control benefits, the supply of water and electricities, recreational benefits, and the benefits from the transportation services available from the waterway. The construction spending impact was investigated by Kim [16]. The measurement of the flood control benefits, economic impact of the water and electricity supplies, and the recreational benefits are beyond the scope of this research because they require a seperate model to evaluate each of those impacts. This research concentrates on one problem; namely, the contribution of the waterway system and services on the regional economic development.

The contribution of the waterway system to the regional economics is traced by the change in transportation costs. The waterway lowers the cost of transportation of delivering freights from the local regions to outside markets and vice versa. The lower cost of transportation encourages the industries to relocate to the areas where the combined costs of producing and shipping are minimal. The distinguishing feature of this model is to have the net impact on the regional development which is due to the lower transportation costs. The regional development impacts due to lower wages, attractive tax system, and lower service price of capital are also investigated.

(1.2) A Brief Description of Methodology

The transportation facilities and services available in a region play a crucial role to promote the regional development and trade flows. The economic impact of the navigation system does not confine to the navigated areas. Its impact spreads over all other areas where the trades are made. Land use,

industrial location, interindustry flows, physical distribution of goods, market structure, employment, and trade flows among regions are directly and indirectly affected by the navigation systems and services.

A multiregional variable input-output (MRVIO) model is introduced to investigate the interrelation between navigation systems and their regional impacts. The MRVIO model requires input elasticities and technical progress coefficients as input parameters. These input parameters for the Phase I study were estimated from the 1967 multiregional flow data supplied by the Army Corps of Engineers. Under the Cobb-Douglas production frontiers, the value share after tax becomes the input elasticity. The technical progress parameters were obtained from the input elasticities. Exogenous variables to the model are transportation costs, wage rates, the service price of capital, tax rates, and final demands. The transportation costs include both terminal and linehaul costs. With the input parameters and the exogenous variables, the model determines industrial output, income, employment, regional technical coefficients, trade coefficients, industrial prices, and various multipliers. These endogenous variables predict many policy interested variables such as regional growth, development, and industrial locations, land use patterns, structural changes of industries, trade patterns, physical distribution of goods, and regional inflation. Table 1 provides details of these relationships.

The MRVIO model is a theoretically well-founded, practically useful, policy sensitive, reliable, multipurpose, and a relatively low operating cost model. First, it is theoretically well-founded. The model is consistent with the well-developed theory of firms. The basic hypothesis of the model is that firms are sensitive to the cost change. A change in one of the input costs makes the firms

TABLE 1

Policy Interested Variables and the Multiregional Variable Input-Output Model

Policy Sensitive Issues	Exog. Variables	Input Parameters	Endogenous Variables	Policy Interested Variables
a) Transportaion system, facilities, and services	Transportation Costs (composite index)	Input Elasticities	Industrial Output, income	Regional Growth, Development, and Industrial Location
	Terminal Cost			
i) Construction of highway	Line-Haul Cost	Tech. Progress Parameters	Employment and Population	Land Use
ii) Construction of waterways			Regional Technical Coefficients	Substituting Behavior of firms, Structuctural Change, Industrial Mix
iii) Rail Abandonment				
iv) Subsidy to Rail System			Interindustry Transaction	Market Structure
b) Resource Shortages				
i) Shortage of fuel			Trade Coefficients	Spatial Nature of Trade Patterns
ii) Shortage of other resources			Interregional Trade Flows	Physical Distribution of Goods among Regions
c) Labor Management Disputes	Wage Rates		Industrial Prices	Regional Inflation
d) Foreign Demands	Final Demands		Price Multipliers	Identify the Sources of Regional Cost-push Inflation
e) Tax Reforms	Tax Rates Other Exogenous Input Costs		Output, Employment, and income multipliers	

to remix the inputs so as to maximize their profits. Their input composition and the market distribution of outputs are sensitive to the cost change. These changes make the regional technical coefficients and the trade coefficients to vary. Unfortunately, the conventional multiregional input-output models assume a fixed regional technical coefficient and a fixed trade coefficient. These technical and trade coefficients enter the conventional input-output model as fixed parameters. In our analysis, these technical and trade coefficients are endogenous variables to the model. The industrial locations, trade-flows, and land use patterns are the results of the firms' optimizing behavior.

Transportation facilities such as the Arkansas Navigation System provide energy efficient transportation services to the industries located in the water regions. The industries can sell their products much larger market areas and purchase their inputs from all over the places at relatively cheaper cost. The navigation system not only lowers the costs of inputs, but also encourages the industries to relocate in the waterway regions. Easy accessability through the waterway transportation encourages the product mix in favor of the cheaper materials from all over the regions. The current model responds to such optimizing behavior of firms.

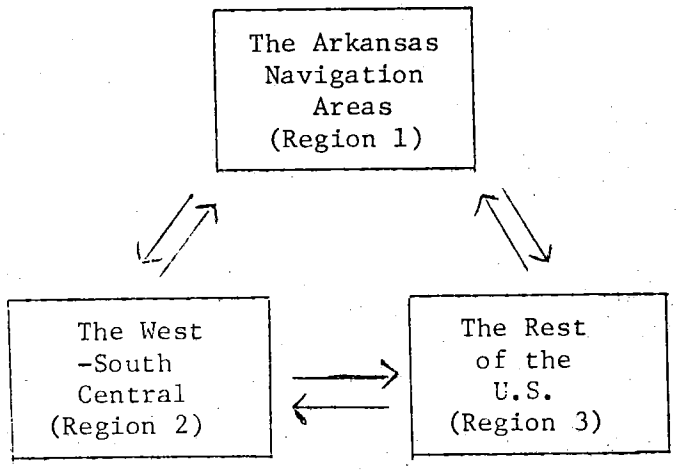
The MRVIO model is derived from the basic duality between production and price frontiers. The basic duality indicates that there is a dual relation between quantities and prices. Any cost minimizing input or output quantities can be expressed in terms of the input prices. We replace all quantity variables in the production frontiers with the price variables, and obtain the price frontiers. These price frontiers are expressed in terms of input elasticities, transportation costs, wage rates, the service price of capital, and technical progress parameters. A change in transportation cost will change the

profit maximizing price levels which in turn determine the regional input-output coefficients and the trade coefficients. Industrial output, income, and employment in each region identify the industrial location, land use, and regional growth. The trade flows identify the physical distribution of commodities and the regional market structures. Secondly, the model also answers many policy sensitive questions. It measures the development impact of the waterway construction. It predicts the industrial location, interregional trade flows, interindustry purchases, and market structure of industrial sales. In the present study, the model was employed to determine the influence of lowered transportation costs, due to the waterways, on regional economic development. The model could be employed to measure the impacts of other transportation services. Table 1 provides some of those policy sensitive questions. Thirdly, the model is flexible and reliable as compared with other existing models. The flexibility of the multiregional variable input-output model is described in the literature review chapter. The reliability of the model was documented in the previous research (Liew-Liew (25)). Finally, it is relatively low cost and multipurpose model. Most of the data gatherings are from the secondary sources; i.e., published data. It doesn't require expensive survey type of data gatherings.

(1.3) The Highlight of Empirical Findings

The U.S. Economy is divided into three regions and ten industrial sectors. Three regions are; Region 1 which is the Arkansas navigation areas (OBE areas 117 to 119); Region 2 which is the west-south central exclusive of the navigation area, and Region 3 which is the rest of the U.S. Ten industrial sectors include agriculture, mining, durable manufacturing, non-durable manufacturing, and six service related industries.

Figure 1 Trade Flows among Regions



A lower transportation cost stimulates trade between regions. The trade coefficient which is a ratio of commodity imported from a region to total amount of the commodity received in the region should be changed when a cost of transportation is lowered. Precisely, how much would it affect on the trade coefficients? To answer the question, we simulate the variable input-output model under varying conditions of the transportation cost. We assume that the transportation cost of delivering commodities between Region 1 and Region 2 has been reduced by 5 percent. It is further assumed that there isn't any change in transportation cost between Region 1 and Region 3 or between Region 2 and Region 3.

As expected, the interregional trades between Region 1 and Region 2 are stimulated after the 5 percent reduction in transportation cost between two regions. Region 1 boosted its import from Region 2 by 3.070 percent of agricultural products, 1.458 percent of mineral products, 3.128 percent of non-durable manufacturing goods, and 3.979 percent of durable manufacturing goods. Region 2 also increases its import from Region 1 by 5.771 percent of agricultural products, 5.596 percent of mining, 6.048 percent of non-durable manufacturing goods, and 5.406 percent of durable manufacturing goods.

TABLE 2

Percentage Change in Trade Coefficients
Before and after the 5 Percent Decrease in Transportation Costs*
(Unit: Percent)

Selected Industries		Region 1 & 2			Region 1 & 2 and Region 1 & 3			All Regions		
		I	II	III	I	II	III	I	II	III
(1) Agricultural, Forest, and Fisheries	I	-1.018	5.771	1.013	-2.013	6.886	7.009	-2.313	4.207	6.712
	II	3.070	-0.251	0.120	0.946	-0.308	0.000	1.538	-2.034	5.596
	III	-2.065	-0.396	-0.021	0.809	-0.443	-0.119	4.944	1.912	-0.479
(2) Mining	I	-3.092	5.596	0.502	-3.358	5.596	5.861	-3.524	4.707	5.023
	II	1.458	-0.081	0.032	0.797	-0.082	0.000	0.864	-0.714	4.009
	III	-3.599	-0.156	-0.013	0.755	-0.156	-0.065	0.629	4.077	-1.217
(3) Non-Durable Manufacturing	I	-0.685	6.048	1.383	-1.953	7.215	7.380	-2.228	4.867	6.714
	II	3.128	-0.227	0.098	0.752	-0.276	0.197	1.276	-1.711	5.610
	III	-2.003	-0.351	-0.021	0.643	-0.379	0.064	0.413	2.440	-0.364
(4) Durable Manufacturing	I	-0.494	5.406	0.655	-2.494	6.652	6.884	-2.741	3.151	7.002
	II	3.979	-1.332	0.114	0.649	-0.053	0.038	1.596	-2.390	6.036
	III	-1.172	-0.256	-0.010	1.689	-0.307	0.073	0.274	1.296	-0.237

*The percentage change was calculated by the logarithmic change; i.e., $\frac{dx}{x} = d \log x \simeq \log(x/x_{-1})$.

Since it is assumed that there isn't any change in the cost of transportation between region 1 & region 3, and between region 2 & 3, the import from region 3 has declined both in region 1 and in region 2. Region 1 decreases its import from region 3 by 2.065 percent of agricultural, forest, and fishery products, 3.599 percent of mineral products, 2.003 percent of non-durable manufacturing products, and 1.172 percent of durable manufacturing products. The region 2 also reduced its import from region 3 by 0.396 percent of agricultural products, 0.156 percent of mineral products, 0.351 percent of non-durable manufacturing products, and 0.256 percent of durable manufacturing products. Why does the lower transportation cost increase the trade coefficients between region 1 and region 2? The lower transportation cost makes the purchase prices of inputs less expensive than before the reduction of transportation cost. Lower input cost makes the firms to sell their products at cheaper prices. Such sales stimulate demands from all other regions. Industries in each region produces more goods to meet such surging demands.

The non-durable manufacturing industry in region 1 could lower its price as much as 1.339 percent after the 5 percent transportation cost reduction between region 1 and region 2. It followed by agricultural prices, -1.068; and by durable manufacturing prices, -.664; and by mineral prices, -0.478. To meet the surging demands, the non-durable manufacturing industry increases its output 2.989 percent more than before the transportation cost reduction. By similar reason, the agricultural industry boosts its ouput by 2.941 percent; mineral products by 2.372 percent; durable manufacturing goods by 2.147 percent more than before. Although there is no change in transportation cost between region 1 and region 3, region 3 imports more commodities from region 1 because of the cheaper price effect.

TABLE 3

Percentage Charge in Industrial Output and Price before and after the 5 Percent Decrease In Transportation Costs

(Unit: Percent)

Selected Industries	Region 1 & 2		Region 1 & 2, Region 1 & 3		All Regions	
	Output	Price	Output	Price	Output	Price
Region 1						
Agriculture, Forest & Fis.	2.941	-1.068	8.966	-2.271	9.777	-2.562
Mining	2.372	-0.478	6.568	-0.911	6.890	-0.984
Non-druable Mfg.	2.989	-1.339	7.015	-2.465	7.534	-2.727
Durable Mfg.	2.147	-0.664	8.559	-2.012	8.980	-2.200
Region 2						
Agriculture, Forest & Fis.	0.531	-0.164	0.717	-0.207	5.501	-1.413
Mining	0.286	-0.050	0.362	-0.059	3.404	-0.374
Non-durable Mfg.	0.277	-0.138	0.345	-0.170	3.248	-1.225
Durable Mfg.	0.313	-0.114	0.414	-0.150	4.857	-1.538
Region 3						
Agriculture, Forest & Fis.	0.028	-0.017	0.166	-0.081	0.783	-0.361
Mining	0.002	-0.004	0.043	-0.020	0.525	-0.165
Non-durable Mfg.	0.019	-0.016	0.099	-0.068	0.562	-0.373
Durable Mfg.	0.010	-0.008	0.086	-0.052	0.437	-0.234

Region 3 boosts its import from region 1 by 1.013 percent of agricultural products, 0.502 percent of mineral products, 1.383 percent of non-durable manufacturing goods, and 0.655 percent of durable manufacturing goods.

The lower transportation cost between region 1 and region 2 stimulates not only growth of region 1's industries but also the development of region 2's industries. The largest growth impact in region 2 comes to agricultural industry (0.531 percent), followed by durable manufacturing (0.313 percent), mining (0.286 percent), and non-durable manufacturing (0.277 percent). This growth is due to the cheaper price effects. The industries in region 2 can produce much cheaper products after the 5 percent transportation cost reduction. Agricultural price is lowered as much as 0.164 percent. The price of non-durable manufacturing goods is down by 0.138 and that of durable manufacturing goods is reduced by 0.114. The least price impact comes to mineral industry in which the price index is down by only 0.050 percent.

The cheaper prices of the goods produced in region 2 attract more customers from region 3. After the five percent transportation cost cut, region 3 imports more from region 2 by 0.120 percent of agricultural product, 0.032 percent of mineral product, 0.098 percnt of non-durable manufacturing goods, and 0.114 percent of durable manufacturing goods.

The 5 percent decrease in transportation cost between region 1 and region 2 makes the local purchase of inputs unattractive. The input prices in each region may not be the same. Firm's basic principle is to purchase inputs from all regions so as to maximize their profits. The profit maximizing condition is to hire inputs from all regions so that marginal revenue from each input is equal to the marginal cost. The lower transportation cost reduces the marginal cost of the inputs from either region 1 or region 2. Lower marginal cost encourages

an import substitution for the local products. The five percent decrease in transportation cost reduces the own trade coefficients which are the ratio of local purchase out of total purchase. (i.e., the diagonal element of the trade coefficient matrix). For example, the own trade coefficients of agricultural products are down by 1.018 percent in region 1, 0.251 percent in region 2, and 0.021 percent in region 3. The own trade coefficients of non-durable manufacturing goods are down by 0.685 percent in region 1, 0.227 percent in region 2, and 0.021 percent in region 3.

So far, we assumed that the five percent reduction in transportation cost was made only between region 1 and region 2 and there is no change in transportation cost either between region 1 and region 3 or between region 2 and region 3. We consider the case where the cost of transportation is reduced to the routes between region 1 and region and 2, and the routes between region 1 and region 3. There is still no change in cost of transporation between region 2 and region 3.

Trades are stimulated between region 1 and region 3, and between region 1 and 2. For example, the region 3 imports more goods from region 1. The import from region 1 is up by 7.009 percent of agricultural product, by 5.861 of mineral products, by 7.380 of non-durable manufacturing goods and by 6.884 percent of durable manufacturing goods. The region 2's import form region 1 is up by 6.886 percent of agricultural products, by 5.596 percent of mineral products, by 7.215 percent of non-durable manufacturing goods and by 6.652 percent of durable manufacturing goods. To meet such surging export demand, region 1 produces more outputs. The industrial growth of region 1 is remarkable after the transportation cost reduction. The agricultural industry grows as much as 8.966 percent, followed by 8.559 percent of durable manufacturing industry, 7.015 percent of non-durable manufacturing industry, and 6.568 percent of mining industry.

When the transportation costs are reduced in all regions, the interregional trades are stimulated among all regions. Local purchases are reduced substantially. Industries in each region rely more on the purchases from other regions. For example, the region 1 reduces its local purchase of agricultural products by 2.313 percent; mineral products by 3.524 percent; non-durable manufacturing goods by 2.228 percent; durable manufacturing goods by 2.741 percent.

The surging interregional demands stimulate the growth of all industries. The biggest growth impact in region 1 comes to the agricultural industry (9.777 percent) followed by durable manufacturing industry (8.980 percent), non-durable manufacturing industry (7.534 percent), and mining industry (6.890 percent). Industries in region 2 enjoy the growth of agricultural industry by 5.501 percent; durable manufacturing industry by 4.857 percent; mining industry by 3.404 percent and non-durable manufacturing by 3.248 percent.

The surging interregional demands stimulate the region 1 industries much more than the region 2 industries. It is because of the differences of the economic size among regions. Suppose that all three regions were stimulated by $10 million dollar more of production because of the surging interregional demand; before the surging demand, we assume that the industry in each region produced the following: $100 million in region 1, $1000 million in region 2, and $10,000 million in region 3. The $10 million additional production would make 10 percent growth in region 1, 1 percent growth in region 2, and 0.1 percent growth in region 3.

Because of the size effect, the region 3, which is the rest of the U.S., shows the smallest impact of the industrial growth, and the region 1 which is the smallest area (a combined area of OBE 117 to 119) enjoys the largest growth impact.

We do not assume that the existence of Arkansas navigation system reduces the cost of transportation by 5 percent in all industrial shipment. In reality, some portion of industrial shipment is carried by the navigation system. The current study simply demonstrates the working of a model which responds to the change in transportation costs. To measure the growth impact of the Arkansas navigation system on local and national economy, we need to estimate the transportation cost differences of the items which were shipped by the navigation system. For example, the coal shipment becomes 5 percent cheaper after shipping through the navigation system, etc. We need to gather all this information to accurately calculate the growth impact solely due to the navigation system. The Phase II study should include such study.

The literature survey is in Chapter 2, the multiregional variable input-output model is presented in Chapter 3. The Chapter 4 discusses the transportation cost simulation procedures and the Chapter 5 provides more of the empirical findings. Chapter 6 describes the Phase II study and Chapter 7 presents a brief concluding remark of the Phase I study.

Chapter 2

A Brief Literature Survey

Economists have long been aware that transportation facilities such as highways, expressways, waterways, or railways contribute to regional growth by influencing industrial and trade structures in the benefited regions. Recently, interest in transportation planning has focussed on developing an accurate, workable model for evaluating the economic impact of transportation facilities on the surrounding regional economies. Economic researchers have introduced a number of interesting models to measure the economic effect of the transportation facilities. The modeling effort may be classified into three groups: regional econometric models, spatial equilibrium models, and multiregional input-output models.

The econometric models describe regional economy by a set of behavioral and institutional equations. Transportation cost becomes a pivotal variable to influence regionally important variables such as income, output, and trade. The models demonstrate that construction of transportation facilities reduces the transportation cost of shipping goods and such lower transportation cost stimulates regional development and interregional trade flows.

The multiregional, multi-industry (MRMI) forecasting model developed by Harris (12, 13) is one such example of an econometric model. Another example is the Denison Reservoir impact model developed by Liew (23). The spatial equilibrium analysis divides an economy into several geographically identifiable regions. Each region trades commodities with other regions. Usual market demand and supply schedules represent those buying and selling behaviors of the region. The spatial equilibrium model hypothesizes that an improvement of transportation

facilities lowers the transportation costs and the lower costs stimulate interregional trades of those commodities. Examples of such spatial equilibrium approach are in the writings of Tinbergen (32), Bos-Koyck (5), and Liew-Shim (24). The impact analysis on the basis of the spatial equilibrium model is a theoretically well-founded and empirically promising approach. The major weakness of this approach is its assumption of linearity on demand and supply equations. Furthermore, in many cases, it is a difficult task to make a reliable estimate of demand and supply equation for each one of all commodities in each region.

The multiregional input-output (MRIO) models developed by Isard (11), Moses (26), Leontief-Strout (19), and Polenske (28) are other popular tools to evaluate the economic impact of transportation facilities on regional economy. The MRIO Models utilize three sets of the basic data; regional technical coefficients, trade coefficients, and regional final demand. Under the assumption of fixed technical coefficients and fixed trade coefficients, the model predicts industrial output, income, employment, trade flows, and interindustry transactions. Regional final demand enters the model as an exogeneous variable. Regional growth is usually identified by the change in final demand component. Output, income, and employment multipliers are popular tools to identify such regional growth impact. The multipliers are the chain reactions of a one-dollar change in final demand in a region on the industrial output, income, and employment in all regions. Occasionally, the model is simulated by changing a set of technical coefficients or by changing a set of trade coefficients. New technology or energy conservation justifies such change in technical coefficients. A lower transportation cost due to a better transportation facility justifies change in both technical coefficients and trade coefficients. The Regional development impact resulting from the introduction of new technology, energy conservation or construction of a highway is often measured by the simulation method.

The multiregional multi-industry (MRMI) models and the multiregional input-output (MRIO) models require further discussion of their strengths and limitations.

The MRMI forecasting model is a regional econometric model which covers 216 sectors.[1] The structural equations of the model were fitted by the county data for the period from 1965 to 1966. The change in regional output was explained by input prices and the agglomeration variables that firms faced in the location. The input prices include marginal transportation costs, wage rates, land prices, and cost of capital. The agglomeration variables include all other key nonprice variables that affect the industrial location. An example of such variable is congestion variable.

The output variables determine other regionally important variables such as employment, population, earnings, personal income, personal consumption, government expenditures, investment and foreign exports.

The marginal transportation cost which is computed by the transportation cost linear programming algorithms plays a key role to determine industrial locations and to influence the regional economic activities. An improvement of a transportation facility lowers the marginal transportation cost which, in turn, stimulates the regional outputs and other regional economic activities. For each of the SMSA counties, the model forecasts those regionally important economic variables for the years from 1970 to 1985. The sum of regional forecasts was controlled so that its sum becomes equal to Almon's national forecasts [Almon (1)].

The MRMI forecasting model is one of the most successful regional econometric forecasting models. Simultaneous determination of demand and supply is considered the strength of the econometric model. Introduction of the transportation cost in the output share equations is another interesting feature of this model.

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[1] 99 industrial, 28 construction, 8 governmental, 69 equipment purchasing, 6 population, 2 extra imports and 4 extra labor sections.

But like many other regional econometric models, a paucity of regional data forces the model builder to choose the explanatory variables on empirical rather than theoretical grounds. The impressive R-squares in sample equations do not guarantee the reliable forecasting performance of the nonsample period. The estimated coefficients may vary from one sample to another. Long-run economic forecast and economic impact analysis require stability of the estimated coefficients, but the lack of such stability necessitates re-estimation of the coefficients each year. Another weakness is the MRMI's failure to consider the maximizing behavior of firms. According to a well-developed theory of firms, each firm mixes its inputs so as to maximize profits. Transportation cost is simply one of these many input costs, along with purchase prices of intermediate inputs, wage, land costs, and the service price of capital. The MRMI fails to incorporate all these input prices into the model. It does select some of those input prices on empirical grounds.

The multiregional input-output model is one of the most promising tools used to forecast regional growth and interregional trade structures. However, the most serious drawback of this approach is its assumption of fixed technical coefficients.

Amano-Fujita (2) modifies the multiregional input-output model so that transportation costs explicitly enter the model. Following the Moses' multiregional input-output model (26), the regional input-output coefficients are assumed to be products of trade coefficients and regional technical coefficients. The model specifies that the trade coefficients and the regional technical coefficients depend on the transportation cost. An improvement of a transportation facility lowers the transportation cost which increases the trade coefficients in the benefited regions and reduces the transportation purchase

coefficients. The transportations purchase coefficient denotes the input coefficient of transportation service by each industry (the row coefficients of the transportation sector; a^{r}_{Tj} j=1, ...n; r=1, ...m, T= transportation service sector). These two changes create a chain impact on regional and national economies. The economic impact of an improvement of transportation facilities can be measured by tracing these two changes.

The model suggests an interesting way to introduce the transportation cost into the multiregional input-output model. However, it assumes that only one row of technical coefficients, namely transportation purchase coefficients, depend on the cost of transportation, and all other technical coefficients remain unchanged. Any change in the transportation purchase coefficients is completely absorbed by the value added coefficients. The model also assumes that only the trade coefficients between regions, where the transportation costs were charged, are affected by the cost change. All other trade coefficients are assumed to remain unchanged. The model implicitly assumes that both trade coefficients and technical coefficients are independent of a change in labor costs, land prices, capital costs, purchase price of input, or sales price of output.

The major drawback of this approach is its incapability of incorporating the input costs into the trade and technical coefficients except for the transportation cost. The model is neither capable of responding to the input substitution behavior of firms in response to the input cost change, nor capable of tracing the import substitution behavior of firms in response to the regional price differentials.

The basic hypothesis of our model is that firms choose inputs from each region so as to minimize their costs and they sell their products to all other regions so as to maximize their profits. The technical coefficients and trade

coefficients are results of the optimizing behavior of firms. Therefore, any change in input costs which include labor cost, land cost, capital cost, purchase price of input, transportation cost and tax rate, or any change in sales price should change all technical coefficients and all trade coefficients. The firms substitute less expensive input for expensive one from each region. The transportation cost is one of the input costs and any change in transportation cost should affect all technical coefficients and all trade coefficients.

The purchase price of input, technical changes, and sales price of output as determinants of the technical coefficients were suggested by Walras as early as the late nineteenth century [Walras (33)]. Recently, Hudson and Jorgenson successfully introduced the prices into the variation of technical coefficients. Their model solves both macro and interindustry variables at the national level [Hudson-Jorgenson (14,15)].

Hudson-Jorgenson's single region variable input-output model is revised and extended to a multiregion variable input-output model. Instead of starting from a translog price frontier which Hudson-Jorgenson did, we assume that each output is produced by an additive and homogenous production function. We derive an additive and homogeneous price frontier for each product from the profit maximizing condition. By jointly solving the price frontiers, we obtain the profit maximizing price level. Our price frontiers contain the cost of transportation, wage rates, land costs, capital cost and effective tax rate as explanatory variables. Transportation cost does not enter the Hudson-Jorgenson model. Our variable regional coefficients and trade coefficients are derived from the input-output transformation relations. Hudson and Jorgenson derived the technical coefficients from the share of equations.

Our multiregional variable input-output model is consistent with the neoclassical theory of firm. The model neither assumes fixed technical coefficients nor assumes fixed trade coefficients. The regional technical coefficients and the trade coefficients are endogenous variables in the model. These coefficients are explained by the intermediate purchase prices, transportation costs, tax rates, wage rates, land cost, capital cost and input elasticities.

From the basic duality between production and price possibility frontiers, we derive a set of price frontier equations. By jointly solving the price equations, we obtain the equilibrium price of each industrial output in each region. These equilibrium prices enter the input-output transformation function as explanatory variables. Our variable regional technical coefficients and trade coefficients are obtained from the input-output transformation relations. The wage rates, land prices, capital costs, transportation costs, and local tax rates affect the equilibrium prices which in turn determine the technical and trade coefficients.

We employ the multi-regional variable input-output model and assess the regional development impact of the Arkansas navigation system in regional and national economies. We hypothesize that the navigation system lowers transportation costs, in terms of both money and time. Such lower transportation costs make the local industries to purchase cheaper inputs from all other regions and to sell their products to the outside markets. The navigation system creates a comparative advantage to the local industries by lowering the purchase price of inputs and by expanding their product markets.

Chapter 3

A Multiregional Variable Input-Output Model

Consider an economy which has m regions and n commodities: Each industrial output in each region is assumed to be produced by a Cobb-Douglas production frontier with a constant return to scale.

$$\ln x_j^r - \alpha_{oj}^r - \sum_{s=1}^{m} \sum_{i=1}^{n} \alpha_{ij}^{sr} \ln x_{ij}^{sr} - \gamma_j^r \ln L_j^r - \delta_j^r \ln K_j^r = 0 \qquad (3\text{-}1)$$

$$(j=1, \ldots n;\ r=1, \ldots m)$$

where

x_j^r = the output of industry j located in region r;

x_{ij}^{sr} = the intermediate purchase of the ith industrial product from region s by the industry j located in region r;

L_j^r = the labor service employed by industry j located in region r;

K_j^r = the service of capital employed by industry j located in region r.

The α_{oj}^r, α_{ij}^{sr}, γ_j^r and δ_j^r are parameters of the Cobb-Douglas production frontiers. We assume the linear homogeneity; namely,

$$\sum_{s=1}^{m} \sum_{i=1}^{n} \alpha_{ij}^{sr} + \gamma_j^r + \delta_j^r = 1 \qquad (3\text{-}2)$$

$$(j=1, \ldots n;\ r=1, \ldots m)$$

We define the purchase price of input as the sum of the price in producing region and the transportation cost of delivering the input to the final user. The transportation cost is a combined cost of the linehaul cost and terminal cost. For example, the purchase price of input i from region s by industry j in region r

(p_{ij}^{sr}) is sum of the price of product i in producing region s (p_i^s) and the cost of transportation of delivering one unit of product i from region s to region r ($\mu_i^{sr} \cdot p_i^s$); i.e.,

$$p_i^{sr} = (1 + \mu_i^{sr})\, p_i^s \tag{3-3}$$ [2]

The profit maximizing input-output transformation functions are;

$$-\frac{f_j^r}{f_{ij}^{sr}} = \frac{(1-t_j^r)\, p_j^r}{c_i^{sr} p_i^s} \tag{3-4}$$

$$-\frac{f_j^r}{f_{L_j}^r} = \frac{(1-t_j^r)\, p_j^r}{w_j^r} \tag{3-5}$$

$$-\frac{f_j^r}{f_{K_j}^r} = \frac{(1-t_j^r)\, p_j^r}{v_j^r} \tag{3-6}$$

(i, j=1, ...n; r, s=1, ...m)

Where f_j^r, f_{ij}^{sr}, f_{ij}^r, $f_{L_j}^r$ and $f_{K_j}^r$ are the partial derivatives of the Cobb-Douglas frontiers with respect to x_j^r, x_{ij}^{sr}, L_j^r and K_j^r respectively. The p_i^r, w_j^r and v_j^r are the price of product i, wage rate, and the service price of capital on industry j in region r respectively. t_j^r is the effective tax rate on industry j in region r and c_i^{sr} is the unity plus the unit transportation cost rate; i.e.,

$$c_i^{sr} = (1 + \mu_i^{sr}) \tag{3-7}$$

(i=1, ...n; s, r=1, ...m)

From the input-output transportation functions (3-4) - (3-6), we derive the following profit maximizing input demand equations;

$$x_{ij}^{sr} = \alpha_{ij}^{sr}\, (1-t_j^r)\, p_j^r\, x_j^r / (c_i^{sr} p_i^s) \tag{3-8}$$

[2] We assume $p_{ij}^{sr} = p_i^{sr}$

$$L_j^r = \gamma_j^r (1-t_j^r)\ p_j^r\ x_j^r/w_j^r \tag{3-9}$$

$$K_j^r = \delta_j^r (1-t_j^r)\ p_j^r\ x_j^r/v_j^r \tag{3-10}$$

By replacing the right hand side of expression in equations (3-8) to (3-10) into the Cobb-Douglas production frontier (3-1), we obtain the following relations;

$$\ln x_j^r - \alpha_{oj}^r - \Sigma\Sigma\ \alpha_{ij}^{sr} \ln(\alpha_{ij}^{sr}(1-t_j^r)\ p_j^r\ x_j^r/(c_i^{sr} p_i^s))$$

$$- \gamma_j^r \ln(\gamma_j^r(1-t_j^r)\ p_j^r x_j^r/w_j^r) - \delta_j^r \ln(\delta_j^r(1-t_j^r)p_j^r\ x_j^r/v_j^r) = 0$$

or

$$\ln x_j^r - \alpha_{oj}^r - \Sigma\Sigma\ \alpha_{ij}^{sr} \ln\alpha_{ij}^{sr} - \Sigma\Sigma\ \alpha_{ij}^{sr} \ln(1-t_j^r) - \Sigma\Sigma\ \alpha_{ij}^{sr} \ln p_j^r$$

$$- \Sigma\Sigma\ \alpha_{ij}^{sr} \ln x_j^r + \Sigma\Sigma\ \alpha_{ij}^{sr} \ln c_i^{sr} + \Sigma\Sigma\ \alpha_{ij}^{sr} \ln p_i^s$$

$$- \gamma_j^r \ln\gamma_j^r - \gamma_j^r \ln(1-t_j^r) - \gamma_j^r \ln p_j^r - \gamma_j^r \ln x_j^r + \gamma_j^r \ln w_j^r$$

$$- \delta_j^r \ln\delta_j^r - \delta_j^r \ln(1-t_j^r) - \delta_j^r \ln p_j^r - \delta_j^r \ln x_j^r + \delta_j^r \ln v_j^r = 0 \tag{3-11}$$ [3]

By the homogeniety assumptions (i.e., $\Sigma\Sigma\ \alpha_{ij}^{sr} + \gamma_j^r + \delta_j^r = 1$), $\ln x_j^r$ vanishes in the equation (2-11), and we obtain the multiregional price frontier equations.

$$\ln p_j = - \alpha_{oj}^r - \Sigma\Sigma\ \alpha_{ij}^{sr} \ln\alpha_{ij}^{sr} - \gamma_j^r \ln\gamma_j^r - \delta_j^r \ln\delta_j^r - \ln(1-t_j^r)$$

$$+ \Sigma\Sigma\ \alpha_{ij}^{sr} \ln c_i^{sr} + \Sigma\Sigma\ \alpha_{ij}^{sr} \ln p_i^s + \gamma_j^r \ln w_j^r + \delta_j^r \ln v_j^r = 0$$

$$(j=1, \ldots n;\ r=1, \ldots m) \tag{3-12}$$

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[3] Unless stated otherwise, $\Sigma\Sigma$ denotes

$$\sum_{s=1}^{m} \sum_{i=1}^{n} .$$

Price frontier equations (3-12) can be conveniently stacked as a following matrix form.

$$(I - S)\ \ln p = h \tag{3-13}$$

where $\underset{(nm,nm)}{S} = \begin{bmatrix} \alpha^{11} & \cdots & \alpha^{ml} \\ \vdots & & \vdots \\ \alpha^{1m} & \cdots & \alpha^{mm} \end{bmatrix}$ $\underset{(nm,1)}{\ln p} = \begin{bmatrix} \ln p^{1} \\ \vdots \\ \ln p^{m} \end{bmatrix}$ $\underset{(nm,1)}{h} = \begin{bmatrix} h^{1} \\ \vdots \\ h^{m} \end{bmatrix}$

and

$$\underset{(n,n)}{\alpha^{sr}} = \begin{bmatrix} \alpha^{sr}_{11} & \cdots & \alpha^{sr}_{nl} \\ \vdots & & \vdots \\ \alpha^{sr}_{1n} & \cdots & \alpha^{sr}_{nn} \end{bmatrix} \quad \underset{(n,1)}{\ln p^{r}} = \begin{bmatrix} \ln p^{r}_{1} \\ \vdots \\ \ln p^{r}_{n} \end{bmatrix} \quad \underset{(n,1)}{h^{r}} = \begin{bmatrix} h^{r}_{1} \\ \vdots \\ h^{r}_{n} \end{bmatrix}$$

I is an $(n \cdot m)$ by $(n \cdot m)$ identity matrix.

The h^{r}_{j} is sum of all other variables except the price variables; i.e.,

$$h^{r}_{j} = -\left(\Sigma\Sigma\ \alpha^{sr}_{ij} \ln\alpha^{sr}_{ij} + \gamma^{r}_{j} \ln\gamma^{r}_{j} + \delta^{r}_{j} \ln\delta^{r}_{j}\right) - \alpha^{r}_{oj}$$
$$+ \Sigma\Sigma\ \alpha^{sr}_{ij} \ln c^{sr}_{i} - \ln(1-t^{r}_{j})$$
$$+ \gamma^{r}_{j} \ln w^{r}_{j} + \delta^{r}_{j} \ln v^{r}_{j} \tag{3-14}$$

In the price frontier equation, we implicitly assumed that the transportation cost of delivering commodity i from region s to region r is the same regardless of type of buyers; i.e.,

$$c^{sr}_{i} = c^{sr}_{ij} \tag{3-15}$$

where

$c^{sr}_{i} = 1$ if $s=r$

$c^{sr}_{i} > 1$ if $s \neq r$

$(i, j=1, \ldots n;\ s,r=1,\ldots m)$

The price frontiers are expressed in terms of the cost of transportation ($c_i^{sr} = (1+\mu_i^{sr})$), effective tax rate ($t_j^r$), local wage rates ($w_j^r$), service price of capital (v_j^r), input elasticities (α_{ij}^{sr}, γ_j^r, δ_j^r) and technical progress parameters (α_{oj}^r).

In general, the profit maximizing price level has a positive relation with the cost of transportation, effective tax rates, wage rates, the service price of capital and has a negative relation with the technical progress parameters.

By jointly solving the price frontiers (3-13), we obtain nm profit maximizing price levels which are expressed in terms of the cost of transportation, effective tax rates, local wage rates, the service price of capital, input elasticities, and technical progress parameters; i.e.,

$$p_j^r = p_j^r\ (c_i^{sr},\ t_j^r,\ w_j^r,\ v_j^r,\ \alpha_{ij}^{sr},\ \gamma_j^r,\ \delta_j^r,\ \alpha_{oj}^r) \tag{3-16}$$

From the input-output transformation function (3-4), we obtain the multi-regional input-output coefficients which are expressed in terms of the equilibrium price levels, effective tax rates, and the cost of transportation; i.e.,

$$a_{ij}^{sr} \equiv \frac{x_{ij}^{sr}}{x_j^r} = \alpha_{ij}^{sr}(1-t_j^r)\ \frac{p_j^r}{c_i^{sr}\ p_i^s} \tag{3-17}$$

From equations (3-16) and (3-17), we obtain the regional variable input-output coefficients which are explained by transportation cost, tax rates, wage rate, the service price of capital, input elasticities, and technical progress parameters;

$$a_{ij}^{sr} = a_{ij}^{sr}\ (c_i^{sr},\ t_j^r,\ w_j^r,\ v_j^r,\ \alpha_{ij}^{sr},\ \gamma_j^r,\ \delta_j^r,\ \alpha_{oj}^r) \tag{3-18}$$

Regional technical coefficients are sum of the regional input-output coefficients over regions; i.e.,

$$a_{ij}^r = \sum_{s=1}^{m} a_{ij}^{sr} \tag{3-19}$$

$$(i,j=1,\ \ldots n;\ r=1,\ \ldots m)$$

Moses [26] calculates the regional input-output coefficients by multiplying the trade coefficients (t_{ij}^{sr}) by the regional technical coefficients; i.e.,

$$a_{ij}^{sr} = t_{ij}^{sr} \cdot a_{ij}^{r} \qquad (3\text{-}20)^4$$

$$(i, j=1, \ldots n;\ s,r=1, \ldots m)$$

From equations (3-20), the following relations are evident.

$$t_{ij}^{sr} = a_{ij}^{sr}/a_{ij}^{r} \qquad (3\text{-}21)$$

$$(i, j-1, \ldots n;\ s,r=1, \ldots m)$$

We obtain the variable trade coefficients which are expressed in terms of transportation costs, primary input prices, tax rates and input parameters from equations (3-18), (3-19) and (3-21); i.e.,

$$t_{ij}^{sr} = t_{ij}^{sr}\ (c_i^{sr},\ t_j^{r},\ w_j^{r},\ v_j^{r},\ \alpha_{ij}^{sr},\ \gamma_j^{r},\ \delta_j^{r},\ \alpha_{oj}^{r}) \qquad (3\text{-}22)$$

The average trade coefficients are estimated as below;

$$t_i^{sr} = \frac{1}{n} \sum_{j=1}^{n} t_{ij}^{sr} \qquad (3\text{-}23)$$

Following the Moses [26], we assume that each industry within the region r consumes the same fraction of the import of the commodity i from region s so that, the trade coefficients (t_{ij}^{sr}) are the same regardless of the final users; i.e.,

$$t_{ij}^{sr} = t_i^{sr} \qquad (3\text{-}24)$$

The average trade coefficients (t_i^{sr}) in equation (3-23) are the Moses type of the trade coefficients. In our model they are obtained from the basic duality of production and price frontiers.

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[4] Moses assumes that $t_{ij}^{sr} = t_i^{sr}$

Regional outputs (x) are determined by the usual balance equations;

$$x = (I - TA)^{-1} Ty \tag{3-25}$$

where

$$\underset{(nm,1)}{x} = \begin{bmatrix} x^1 \\ \cdot \\ \cdot \\ \cdot \\ x^m \end{bmatrix} \quad \underset{(nm,nm)}{T} = \begin{bmatrix} T^{11} & \cdots & T^{1m} \\ \cdot & \ddots & \cdot \\ \cdot & \ddots & \cdot \\ \cdot & \ddots & \cdot \\ T^{m1} & \cdots & T^{mm} \end{bmatrix} \quad \underset{(nm,nm)}{A} = \begin{bmatrix} A^1 & \cdot & 0 \\ \cdot & A^2 & \cdot \\ \cdot & & \cdot \\ 0 & \cdots & A^m \end{bmatrix} \quad \underset{(nm,1)}{y} = \begin{bmatrix} y^1 \\ \cdot \\ \cdot \\ \cdot \\ y^m \end{bmatrix}$$

$$\underset{(n,1)}{x^r} = \begin{bmatrix} x_1^r \\ \cdot \\ \cdot \\ \cdot \\ x_n^r \end{bmatrix} \quad \underset{(n,n)}{T^{sr}} = \begin{bmatrix} T_1^{sr} & \cdots & 0 \\ \cdot & \ddots & \cdot \\ \cdot & \ddots & \cdot \\ \cdot & \ddots & \cdot \\ 0 & \cdots & t_n^{sr} \end{bmatrix} \quad \underset{(n,n)}{A^r} = \begin{bmatrix} A_{11}^r & \cdots & A_{1n}^r \\ \cdot & \ddots & \cdot \\ \cdot & \ddots & \cdot \\ \cdot & \ddots & \cdot \\ A_{n1}^r & \cdots & A_{nn}^r \end{bmatrix} \quad \underset{(n,1)}{y^r} = \begin{bmatrix} y_1^r \\ \cdot \\ \cdot \\ \cdot \\ y_n^r \end{bmatrix}$$

x and y are n·m components vectors of regional output and regional final demand respectively. T and A are n·m by n·m matrices of trade coefficients and regional technical coefficients.

Chapter 4

Cost Simulation and Multiplier Analysis

The multiregional variable input-output model responds to the firm's effort to minimize the input costs. The transportation cost ($c_i^{sr} = 1+\mu_i^{sr}$; s,r=1, ...m, i=1, ...n) is one of such input costs besides wage rates, capital cost, and land cost which the firms face in the local economy. A change in any one of the input cost results in changes in equilibrium outputs, prices, regional technical coefficients, trade coefficients, and various multipliers in all regions. The Table (4-1) provides input parameters, exogenous variables, and endogenous variables. The exogenous variables are assumed to be determined outside of the model. The input parameters are assumed to remain unchanged. Endogenous variables are the dependent variables of the model.

We describe step by step how a change in one of the exogenous variables affects the endogenous variables of the model. The impact of such change affects the equilibrium prices in all regions. To see the relations between exogenous variables and the price levels, we rewrite the price frontier equations as below:

$$\ln p_j^r = g_j^r + \Sigma\Sigma\ \alpha_{ij}^{sr} \ln c_i^{sr} + \gamma_j^r \ln w_j^r + \delta_j^r \ln v_j^r - \ln(1-t_j^r) + \Sigma\Sigma\ \alpha_{ij}^{sr} p_i^s \qquad (4\text{-}1)$$

[5]

where

$$g_j^r = -\alpha_{oj}^r - \Sigma\Sigma\ \alpha_{ij}^{sr} \ln\alpha_{ij}^{sr} - \gamma_j^r \ln\gamma_j^r - \delta_j^r \ln\delta_j^r$$

(j=1, ...n; r=1, ...m)

[5] Unless stated otherwise, $\Sigma\Sigma$ denotes $\sum_{s=1}^{m}\sum_{i=1}^{n}$.

TABLE 4

Input Parameters, Exogenous and Endogenous Variables

Exogenous Variables	Input Parameters	Endogenous Variables
(1) The Multiregional Variables Input-Output Model		
1. Wage rates 2. Service price of capital which includes the land costs and capital costs 3. Costs of transportation 4. Effective tax rates 5. Final demands	1. Input elasticities 2. Technical progress parameters	1. Industrial outputs, income and employment 2. Industrial prices 3. Regional technical coefficients and regional interindustry transactions 4. Trade coefficients and interregional trade flow matrices 5. Various multipliers
(2) The Multiregional Input-Output Models		
1. Final Demands	1. Regional technical coefficients 2. Trade coefficients	1. Industrial outputs, income and employment 2. Regional interindustry transaction 3. Inter-regional trade flows

The price frontier equations are conveniently stacked as a matrix form.

$$(I - S)\ \ln p = g + W \cdot \ln c + \hat{\gamma}\ \ln w + \hat{\delta}\ \ln v - \ln(1-t) \qquad (4\text{-}2)$$

where

$$\underset{(nm,1)}{g} = \begin{bmatrix} g_1^1 \\ \vdots \\ g_n^1 \\ \vdots \\ g_n^m \end{bmatrix} \quad \underset{(nm,nmm)}{W} = \begin{bmatrix} S^1 & & & 0 \\ & S^2 & & \\ & & \ddots & \\ 0 & & & S^m \end{bmatrix} \quad \underset{(n,nm)}{S^r} = \begin{bmatrix} \alpha_{11}^{1r} \cdots \alpha_{n1}^{1r}, \cdots \alpha_{11}^{mr} \cdots \alpha_{n1}^{mr} \\ \vdots \\ \alpha_{1n}^{1r} \cdots \alpha_{nn}^{1r}, \cdots \alpha_{1n}^{mr} \cdots \alpha_{nn}^{mr} \end{bmatrix}$$

$\underset{(mn,mn)}{\hat{\gamma}}$ = a diagonal matrix of γ_j^r;

$\underset{(mn,mn)}{\hat{\delta}}$ = a diagonal matrix of δ_j^r;

$\ln w$ = an m·n components vector of $\ln w_j^r$;

$\ln v$ = an m·n components vector of $\ln v_j^r$;

$\ln(1-t)$ = an m·n components vector of $\ln(1-t_j^r)$.

$$\underset{(nmm,1)}{\ln C} = \begin{bmatrix} \ln C_1^{11} \\ \vdots \\ \ln C_n^{11} \\ \vdots \\ \ln C_1^{mm} \\ \vdots \\ \ln C_n^{mm} \end{bmatrix}$$

The figure inside the parenthesis is the size of the matrix.

The notation defined in Chapter 3 is not defined here.

By taking derivative of the price frontier vector function (4-2) with respect to each cost vector, we obtain the relation between a change in cost variable and its impact on equilibrium prices;

$$\frac{\partial \ln p}{\partial \ln c} = ((I-S)^{-1} W)' \qquad (4\text{-}3)$$

$$\frac{\partial \ln p}{\partial \ln w} = ((I-S)^{-1} \hat{\gamma})' \qquad (4\text{-}4)$$

$$\frac{\partial \ln p}{\partial \ln v} = ((I-S)^{-1} \hat{\delta})' \qquad (4\text{-}5)$$

$$\frac{\partial \ln p}{\partial \ln(1-t)} = -((I-S)^{-1})' \qquad (4\text{-}6)$$

The prime (′) denotes the transpose.

$((I-S)^{-1} W)'$ is an (n·m·m) by (n·m) transportation cost related price multipliers. It explains a corresponding change in equilibrium prices in each industry in each region resulting from a one percent change in c_i^{sr} which is unity plus rate of transportation cost $(1+\mu_i^{sr})$. The transportation cost related price multipliers explain every detail of the impact of a transportation cost change on the industrial prices in all regions.

A change in transportation cost for a single commodity between two regions could affect the equilibrium prices of all commodities in all regions. Same rate increase in transportation cost for two different commodities yields completely different price impacts in all regions. From the policy point of view, these two statements are very important. It implies that a construction of waterway in Oklahoma and Arkansas could affect the price of bread purchased by a New Yorker. The increase in motor fuel cost may have different price impact depending on which commodity is shipped with the motor fuel. The transportation cost related price multipliers provides details of such interesting questions.

The right hand expressions of equation (4-4), (4-5) and (4-6) are wage related price multipliers, service price of capital related price multipliers, and tax rate related price multipliers. All regional economies are interrelated. A change in one of these prices and tax rates not only affects the industrial prices of that region but also affect those of all other regions. These chain impacts are traceable by those multipliers.

The new price structure resulting from a change in transportation costs, or a change in primary input prices such as the wage rates and the service prices of capital, affects the multiregional input-output coefficients. These coefficients are decomposed into regional technical coefficients and trade coefficients.

From equations (3-17), the following relation is evident.

$$\ln a_{ij}^{sr} = \ln \alpha_{ij}^{sr} + \ln(1-t_j^r) - \ln c_i^{sr} - \ln p_i^s + \ln p_j^r \qquad (4-7)$$

If the transportation cost is the only change in the economy, the rate of change in multiregional input-output coefficients can be easily identified as below;

$$\frac{\partial \ln a_{ij}^{sr}}{\partial \ln c_i^{sr}} = \frac{\partial \ln p_j^r}{\partial \ln c_i^{sr}} - 1 - \frac{\partial \ln p_i^s}{\partial \ln c_i^{sr}} \tag{4-8}$$

or $$\partial \ln a_{ij}^{sr} = \partial \ln p_j^r - \partial \ln c_i^{sr} - \partial \ln p_i^s \tag{4-9}$$

The right hand expressions of equations (4-8) are simply transportation cost related price multipliers obtained in equations (4-3).

Suppose we have a base year multiregional input-output coefficients $(a_{ij}^{sr}(t_o))$, we may evaluate the new input-output coefficients after the change in transportation cost $(a_{ij}^{sr}(t_1))$ as below;

$$a_{ij}^{sr}(t_1) = a_{ij}^{sr}(t_o) \text{ EXP } (\partial \ln p_j^r - \partial \ln c_i^{sr} - \partial \ln p_i^s) \tag{4-10}$$

(Note: $\partial \ln a_{ij}^{sr}$ is approximated by $\ln a_{ij}^{sr}(t_1) - \ln a_{ij}^{sr}(t_o)$ or $\ln(a_{ij}^{sr}(t_1)/a_{ij}^{sr}(t_o))$.

Similarly, the change in wage rate, service price of capital and the effective tax rates is traced as below;

$$\frac{\partial \ln a_{ij}^{sr}}{\partial \ln w_j^r} = \frac{\partial \ln p_j^r}{\partial \ln w_j^r} - \frac{\partial \ln p_i^s}{\partial \ln w_j^r} \tag{4-11}$$

$$\frac{\partial \ln a_{ij}^{sr}}{\partial \ln v_j^r} = \frac{\partial \ln p_j^r}{\partial \ln v_j^r} - \frac{\partial \ln p_i^s}{\partial \ln v_j^r} \tag{4-12}$$

$$\frac{\partial \ln a_{ij}^{sr}}{\partial \ln(1-t_j^r)} = \frac{\partial \ln p_j^r}{\partial \ln(1-t_j^r)} + 1 - \frac{\partial \ln p_i^s}{\partial \ln(1-t_j^r)} \tag{4-13}$$

These multiregional input-output coefficients (a_{ij}^{sr}) decompose into the reginal technical coefficients (a_{ij}^r) and trade coefficients (t_i^{sr}) as explained in equations (3-18) to (3-23) in Chapter 3.

A change in regional technical coefficients and trade coefficients results

in change in industrial outputs, income and employment.

A one dollar change in final demand creates a chain impact on industrial outputs. The chain impact is traced by the output multipliers. The multiregional variable input-output model yields the following output, income and employment multipliers;

We define:

$M = (I-TA)^{-1} = \{M_{ij}^{sr}\}$: an n·m by n·m direct and indirect requirement matrix of the multiregional input-output coefficients ($a_{ij}^{sr} = t_i^{sr} \cdot a_{ij}^{r}$). The matrices T and A are defined in chapter 2;

I : an n·m by n·m identity matrix;

$K = \{K_i^r\}$: an n·m component income coefficient vector;

$E = \{e_i^r\}$: an n·m component employment coefficient vector;

The multiregional output, income and employment multipliers are caculated as below;

$$\text{Output multipliers} \qquad TM_j^r = \sum_{s=1}^{m} \sum_{i=1}^{n} M_{ij}^{sr} \tag{4-14}$$

$$\text{Income multipliers} \qquad IM_j^r = \sum_{s=1}^{m} \sum_{i=1}^{n} M_{ij}^{sr} \cdot K_i^s \tag{4-15}$$

$$\text{Employment multipliers} \qquad EM_j^r = \sum_{s=1}^{m} \sum_{i=1}^{n} M_{ij}^{sr} \cdot e_i^r \tag{4-16}$$

for r=1, ...m, j=1, ...n.

The transportation cost, wage rate, service price of capital could affect the regional technical coefficients (a_{ij}^r) and trade coefficients (t_i^{sr}). Therefore, they also affect the output, income and employment multipliers.

The study by Kim [16] measures the impact of the spendings resulting from

the construction of the navigation system on regional economic development. The study employs the conventional multiregional input-output model which assumes the fixed regional technical coefficients and the fixed trade coefficients.

Our study measures the regional development effect of the navigation system, not the development impact from the construction spendings on regional economies.

The Arkansas navigation system lowers transportation costs. We select items which are mostly shipped by the waterways. The cost of delivering these products per ton mile is calculated with the waterway and without the waterways. The waterway transportation is considered as more energy efficient than other types of transportation.

A change in transportation cost affects the equilibrium prices, industrial outputs, incomes, employment, trade coefficients, and regional technical coefficients in the first round. These changes could affect in the second round the local wage rates, land costs, and tax rates which in turn affect the equilibrium prices, output, income and employment. Conceptually, we define the first round effect as a short run transportation impact. The combined first and second round effect as a long run transportation impact.

Before the construction of the Arkansas navigation system, the local land prices and wage rates are much cheaper than those of other commercially developed areas. The navigation system stimulates the interregional trade and regional growth. Local industry now offers higher wage rates and the land prices go up as more people migrate into the areas. The long-run transportation effect of the Arkansas navigation system should consider the combined effects of both the first round and the second round impacts. In summary, the short-run impact is the initial impact of a change in transportation cost on the regional economy

and the long-run impact is a combined impact of the short-run and the continuing effects initiated from the initial transportation cost change.

We measure the short-run economic impact of the transportation cost change. The long-run impact study is beyond scope of the phase I study.

Chapter 5

Empirical Findings

The variable input-output model responds to the optimizing behavior of firms in response to a change in input costs. Transportation costs, wage rates, and the service price of capital are important input costs to the firms. The service price of capital includes the land cost and the capital cost. Any change in these input costs affects the firm's decision on input demands and output prices. In this process, regional technical coefficients, trade coefficients, industrial growth, and regional inflation are affected.

Using the 1963 interregional flow data, we simulate a change in input cost and investigate their impacts on regional development and trade structures.

Following the Army Corps of Engineers regional classification, we divide the U.S. economy into three regions: (1) Region 1 is Arkansas navigation region which is a combined area of OBE areas 117 to 119, (2) Region 2 is West South Central region excluding the region 1. The West South Central region includes Texas, Louisiana, Arkansas and Oklahoma, (3) Region 3 is the rest of the U.S.

The U.S. industries were aggregated into ten industrial sectors: (1) Agricultural forestry and fishing, (2) mining, (3) construction, (4) nondurable manufacturing, (5) durable manufacturing, (6) transportation, communication and utility, (7) wholesale and retail trade, (8) finance, insurance and real estate, (9) service, and (10) federal, state and local government.

The 1963 four region ten-sector interregional transaction table compiled by Dr. Kim (16) was used as the base year data for our study.[6]

(5.1) Economic Impact of Transportation Costs on Regional Development and Trade Structure

[6] We aggregate the four region ten-sector flow matrix by Dr. Kim into three region ten-sector flow matrix by combining region 3 and region 4.

We introduced a 5 percent change in transportation cost: (1) between regions 1 & 2 (no change in transportation cost between regions 2 & 3 and between regions 1 & 3), (2) between regions 1 & 2, and regions 1 & 3 (no change in transportation cost between regions 2 & 3) and (3) among all three regions. We assume that the transportation cost has been changed in both ways in delivering and receiving the commodities of the following sector; agricultural, forest and fisheries, mining, nondurable manufacturing, durable manufacturing, financial and insurance, and service industries.

A 5 percent decrease in transportation costs betwen region 1 and region 2 substantially increases trades between two regions. Prior to the 5 percent decrease, region 1 imported 33.7 percent of agricultural products, 68.7 percent of mining products, 31.8 percent of nondurable manufacturing, and 20.0 percent of durable manufacturing goods from region 2. At the same time, region 2 imported 5.1 percent of agricultural products, 1.4 percent of mining products, 4.0 percent of nondurable manufacturing goods, and 3.8 percent of durable manufacturing goods from region 1.

After 5 percent decrease in transportation cost, region 1's imports increase 34.7 percent of agricultural products, 69.7 percent of mining products, 32.8 percent of nondurable manufacturing goods and 20.7 percent of durable goods from the region 2. Region 2 imports 5.35 percent of agricultural products, 1.46 percent of mining products, 4.26 percent of nondurable manufacturing goods, and 3.99 percent of durable manufacturing goods.

The trade expansion between region 1 and region 2 makes both regions to reduce their industrial consumption of locally produced goods and their imports from region 3. This is because the cost of delivering and receiving goods from region 3 to either region 1 or region 2 becomes relatively expensive since it was assumed that there was no change in transportation cost between either regions 1 & 3 or regions 2 & 3, and only the transportation cost between regions 1 & 2 was decreased.

As the transportation costs were reduced between regions 1 & 2 and regions 1 & 3, the trade coefficients of its own region are further down in all three regions. It implies that each region relies more on imports from other regions and less on locally produced goods. For example, the own trade coefficients of nondurable manufacturing goods were 26.37 percent in region 1, 61.69 percent in region 2, and 94.21 percent in region 3 in 1963.[7] A 5 percent decrease in transportation costs between region 1 and region 2 reduces those own trade coefficients to 26.19 percent in region 1, 61.56 percent in region 2, and 94.20 percent in region 3. A 5 percent decrease between regions 1 & 2 and between regions 1 & 3 further reduces the own trade coefficient of nondurable manufacturing goods to 25.86 percent in region 1, 61.53 percent in region 2, and 94.16 percent in region 3. The 5 percent decrease among all three regions reduces the own trade coefficients to 25.78 percent in region 1, 60.65 percent in region 2, and 93.87 percent in region 3. A decrease in own trade coefficients implies an increase in import coefficients; i.e., the off-diagonal coefficients of the trade coefficient matrix. In general, the import coefficient has an inverse relation with the cost of the transportation between two regions. Table 1 and Table 2 in Appendix 1 provide details of those changes for the selected commodities before and after the deduction of 5 percent transportation costs.

A 5 percent increase in transportation cost among all regions which may be caused by the OPEC crude petroleum price hike this year substantially increases the own trade coefficients in all three regions. For example, the own trade coefficient of durable manufacturing goods has jumped up to 18.78 percent from 18.27 in region 1, to 38.46 percent from 37.56 percent in region 2, to 96.68 percent from 96.47 percent in region 3 between the period before and after the 5 percent transportation cost hike.

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[7] Own trade coefficient in the diagonal coefficient of the trade coefficient matrix.

Another interesting feature of this study is that the trade coefficient in all regions changes in response to a change in transportation cost between any two regions. A 5 percent decrease in transportaion cost between region 1 and region 2 also changes the import structure of region 3. For example, the region 3's import of the nondurable manufacturing goods from region 1 has increased from .718 percent to .728 percent and its import from region 2 has risen from 5.066 percent to 5.071 percent after the reduction of the transportation cost between region 1 and region 2. There was neither change in transportation cost between region 1 and 3, nor change in transportation cost between 2 and 3. However, their trade coefficients have changed. This result contrasts with the results of Amano and Fujita (2).[8]

Next we investigate regional growth and deflation impact of the 5 percent decrease in transportation cost. We consider two cases: case one is a 5 percent decrease in transportation cost between region 1 and region 2, and case 2 is a 5 percent decrease in transportation cost among all three regions.

A 5 percent decrease in transportation cost between region 1 and region 2 stimulates region 1 most. The nondurable manufacturing industry in region 1 grows as much as 2.99 percent after the deduction of the transportation cost. It is followed by agriculture, 2.94 percent; mining, 2.37 percent; and durable manufacturing industry, 2.15 percent. The construction, financial and service industries share the same growth rate of .79 percent. In region 1, the least growth impact is on trade, government and transportation, communication and utility industries which are .30 percent, .35 percent and .57 percent respectively.

A relatively weaker impact was observed in region 2 in above case. After the 5 percent reduction in transportation costs the agriculturea, forestry, and

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[8]Amano and Fujita Model assumes that the trade coefficients of other regions in which transportation cost does not change remain unaffected.

fishery industries grow only .53 percent, followed by durable manufacturing, .31 percent; mining, .29 percent; nondurable manufacturing, .28 percent; construction, .17 percent; finance, insurance, and real estate, .13 percent, and service industry, .11 percent. Industrial growth rates in region 3 are virtually unaffected by the transportation cost cut between region 1 and region 2.

When a 5 percent decrease in transportation cost is made among all three regions, the regional impact is much stronger as compared with the previous case. Agricultural, forestry, and fishery industries in region 1 are stimulated as much as 9.78 percent output growth, which is the largest among all industries. Durable manufacturing industry gains 8.98 percent of output increase, followed by nondurable manufacturing, 7.53 percent; mining, 6.89 percent; construction, 2.58 percent; service, 1.90 percent; and transportation, communication, and utilities, 1.70 percent.

The 5 percent decrease in transportation cost among all regions also stimulates the industrial growth of region 2. The strongest growth impact comes to the agricultural, forestry and fishery industries (5.50 percent) followed by durable manufacturing (4.85 percent), mining (3.40 percent), nondurable manufacturing (3.25 percent), construction (2.11 percent), and financial, insurance, real estate (1.08 percent).

The growth impact in region 3 is much smaller than those of either region 1 or region 2. It is because the base year industrial outputs in region 3 are much larger than those of region 1 or region 2. Region 3 covers the rest of the U.S., excluding the West South Central section. Because of the high base year output, the percent change in output, which is calculated by the change in output by the base year output, becomes relatively smaller. The growth rate in agricultural, forestry, and fishery in region 3 is .78 percent, followed by nondurable maufacturing, .56 percent; mining, .53 percent, durable mamufacturing,

.44 percent and construction, .26 percent. The trade, finance, service, and government industries are highly insensitive to the transportation cost change. The growth impact of trade, finance, service, and government industries are only .02 percent, .03 percent, .09 percent and .08 percent respectively.

Transportation cost is a part of the business cost and lower transportation cost contributes to the lower output price. The 5 percent decrease in transportation cost between region 1 and region 2 lowers the price of nondurable manufacturing goods more in region 1. It lowers the price as much as 1.34 percent, followed by the farm price, -1.07 percent, price of durable manufacturing goods, -.66 percent, and construction price, -.64 percent. The price impact in region 2 is observed mostly in farm industry which decreases by .16 percent, followed by nondurable manufacturing, -.14 percent; construction, -.13 percent, and durable manufacturing industry, -.11 percent.

The price impact of the decrease in transportation cost is much stronger when the decrease occurs among all three regions. The biggest price decrease has occurred in nondurable manufacturing goods in region 1. Its price goes down as much as 2.73 percent. The prices of agricultural products, durable manufacturing goods, construction services and mining products are down by 2.56 percent, 2.20 percent, 2.07 percent and .98 percent respectively. The same industrial groups in region 2, except the mining products, have shown the largest price declines in region 2 and region 3 in response to the 5 percent decrease in transportation cost among all regions.

In general, agriculture, durable and nondurable manufacturing, construction and mining industries are highly sensitive, both to changes in output and price and to the change in transportation costs.

Growth and price responses of government, service, finance, trade and transportation, communication and utility industries are less sensitive to the transportation cost change.

Tables 9-13 in Appendix I provide the development and inflation impact of a change in transportation costs.

(5.2) Economic Impact of Primary Input Costs on Regional Development and Inflation

Wage rates and the service price of capital are the primary inputs to firms. We simulate the variable input-output model by increasing these primary input prices. An increase in primary input prices would make the firms produce less and rely more on imports from other regions. They also charge higher prices for their products by passing those price increases on the final users.

Neither the multiregional input-output models [Leontief-Strout (19), Moses (26), Polenske (28)] nor its variation [Amano-Fujita (2)] identifies the relation between those primary input prices and industrial growth. They implicitly assume that those primary input prices are independent of either industrial growth or interregional trade structure.

Our variable input-output model identifies those relations. Wage rates and the service price of capital are two important primary input to firms. A change in the primary input price in a region not only affects industrial growth and inflation of the region but also influences those of other regions. For example, the firms which face a relatively higher wage rates try to pass the higher cost on the final user by raising their output prices. The increase in output prices lowers the industrial demand for the products since firms either economize the products or substitute lesser expensive ones. Unless there is an increase in final demand for the products, the higher price results in lesser production of the output because of lack of demand. Industrial growth in the high price region is hampered and its impact spreads over the regions.

For each region, a 5 percent wage hike is introduced to investigate the regional development and inflation among all regions. First, we introduce the 5 percent wage hike in region 1 with the assumption that the wage rates in region 2 and region 3 remain unchanged.

The wage hike reduces the all industrial outputs in region 1 as expected. The mining sector which relies heavily on labor input is hurt the most. Its industrial output drops as much as 4.83 percent. The industrial outputs of agriculture, durable manufacturing, transportation, trade, and finance drop values between 3.105 percent to 3.42. The least impact on industrial growth comes to the construction industry. Its output is down only by 1.948 percent after the 5 percent wage hike. Industries in region 3 are virtually unaffected by the 5 percent wage hike in region 1. It is because region 1 constitutes a small portion of the entire economy (three OBE areas) as compared to region 3 which is the rest of the U.S. except the West South Central.

However, a 5 percent wage hike in region 3 affects rather significantly its own industrial growth as well as those of region 1 and region 2. The wage hike lowers approximately 3 percent industrial outputs of all sectors in region 3. Its impact on region 1 and region 2 is noticeable. The 5 percent wage hike in region 3 stimulates the industrial growth in mining industry in region 1 and in region 2. The mining industry gains its output increase by as much as 1.81 percent in region 1 and 1.56 pecent in region 2. Except the construction industry, all other industries in region 1 and region 2 are stimulated by the 5 percent wage hike in region 3. It stimulates the agricultural output by 0.729 percent, durable manufacturing goods by 0.668 percent and transportation service by 0.394 percent. Other industries such as nondurable manufacturing, trade, and finance boost their outputs, ranging from 0.274 to 0.18. The construction activity in region 1 is down by 0.788 by the wage hike in region 3.

Economic activities of region 2 are noticeably affected by the wage hike in region 3. Their industrial growth due to the wage hike is slightly weaker than those realized in region 1.

The mining industry is the biggest gainer, 1.56 percent, followed by agriculture (0.561 percent), finance (0.484 percent), transportation (0.297 percent), durable manufacturing (0.154 percent), and trade (0.146 percent). The least impact comes to government (-0.038 percent), service (0.073 percent) and nondurable manufacturing industry (0.096 percent).

The economies of region 1 and region 2 are stimulated because their products are now relatively cheaper as compared with those in region 3. The 5 percent wage hike forces the firms in region 3 to raise their output prices. Some of these firms increase their imports from region 1 and region 2, instead of purchasing the products from region 3. Because of the import substitution effects, region 1 and region 2 produce more outputs.

Table 12 provides the details of regional development impact on all three regions when the wage rate is hiked by a 5 percent in one region and the wage rates of the other two regions are remain unchanged.

The regional development impact of a change in the service price of capital is much weaker than that of wage change. The service price of capital includes the land price and capital costs.

A 5 percent increase in the service price of capital in region 1 reduces the mining industry in the region by 2.85 percent. The construction is least affected by the 5 percent increase. The growth rates of other industries are down by somewhere between 1.44 and 1.98. The region 2 and region 3 are virtually unaffected by the 5 percent increase in the service price of capital in region 1.

A 5 percent increase in the service price of capital in region 2 significantly reduces the growth rates of all industries. Mining industry is hampered most by

the 5 percent change. Its growth rate is down by as much as 2.64 followed by agriculture (-2.07), finance (-2.03), durable manufacturing (-1.84), nondurable manufacturing (-1.81). The construction is least affected by the change. The industrial growth of region 3 are almost unaffected by the 5 percent hike in capital service price. Its impact on region 1 has mixed signs. Mining, finance, and service industries are positively responding to the 5 percent change in the capital service price. Agriculture, construction, manufacturing, and transportation industries are negatively responding to the 5 percent change. The recession in region 2 due to the increase in service price brings a chain recession in region 1. Nondurable manufacturing industry is down by 0.448 percent due to the chain recession.

A 5 percent increase in the service price of capital in region 3 mildly stimulates most industries in region 1 or region 2. Exception is construction and government industries. It is because of the relocation of industries in favor of lower cost areas.

Table 15 gives the detail of the changes in industrial growth in all three regions in each case.

Inflationary impacts of wage hike (see Table 16) is much stronger than those of service price hike (see Table 17).

A 5 percent wage hike in all industries located in region 1 boosts the industrial prices somewhere between 1.609 and 2.808. Transportation, finance, service, government and mining are upper group of the price increase. Interregional impact of the wage hike is very weak.

The same hike in region 2 provides a mild inflationary pressure on industries in region 1. The inflation rates in region 1 is 0.701 percent for nondurable manufacturing goods, 0.524 percent for agricultural products, 0.335 percent for

durable manufacturing goods, 0.323 percent for construction services, and 0.260 percent for mineral products. The inflation rates in region 2 is somewhat higher than the previous case. The own inflationary impact in region 2 is somewhere between 2.913 and 2.166 percents whereas that in region 1 is a range between 2.808 and 1.609 percents. The own inflationary impact means the industrial price impact due to the local wage increase. The inflation impact of the wage increase in region 2 on the region 3 is very minimal. It implies that local wage increase won't affect much on the inflation of the rest of the U.S.

However, the reverse reasoning is not true. The wage increase in all industries in the rest of the U.S. which is the region 3 contributes substantially the inflationary trends in local regions; i.e., region 1 and region 2. Agricultural, construction, nondurable manufacturing, and durable manufacturing in region 1 and in region 2 are most sensitive to the wage hike in region 3. For example, a 5 percent wage hike in the rest of the U.S. (region 3) increases 0.874 percent increases in the price of durable manufacturing goods produced in the water region (region 1) even when there is no change in wage structure in the water region. Such inflationary pressure is generated because the prices of the imported goods from the rest of the U.S. are more expensive in the water region. The reverse reasoning is not true because the import portion of the rest of U.S. from the water region is so small that an increase in prices for the goods produced in the water region won't affect those in the rest of the U.S.

Similar conclusion is obtained when the service price of capital is hiked by a 5 percent. Its inflationary impact is much weaker than that of the wage hike case. Table 17 provides the detail statistics.

(5.3) Economic Impact of Primary Input Costs on Trade Coefficients

The basic hypothesis of the multiregional variable input-output model is that firms are optimizing. The firms purchase inputs from all regions and make

their input purchase from all regions so as to minimize their costs. For example, an increase in wage rate in one region makes the price of the output produced in the region relatively expensive. The other region would purchase small amounts of the input because it is now expensive. Instead, they obtain the input from the local area or from other region where the cost is not expensive. Theoretically, the model predicts that the trade coefficients and the technical coefficients change whenever the primary input costs change.

A 5 percent increase in wage rate in region 1 reduces the own trade coefficients of all industries in region 1. For example, own trade coefficients reduces from 0.30609 to 0.30250 for agricultural, forestry, and fishery; from 0.17442 to 0.17095 for mining; from 0.26370 to 0.26064 for nondurable manufacturing, and from 0.18272 to 0.17998 for durable manufacturing.

The reduction of own trade coefficients means that the industries in region 1 purchase more input from other areas. For example, the farm products purchased by the industries in region 1 from region 2 has increased from 0.33679 to 0.33848 after the 5 percent wage hike in the region 1. The farm product imported from region 3 has gone up to 0.35902 from 0.35712 after the wage increase. Similar increase is observed in all commodities. Table 18 provides the details of those statistics. The own trade coefficients of agricultural forestry and fishery products went up from 0.51958 to 0.51995 for region 2 and from 0.9261 to 0.92636 for region 3 after the 5 percent wage hike in region 1. At the same time, the industries in region 2 imports less percentage of agricultural product from region 1 and import more from region 3. The region 2 purchased the agricultural products from region 1 by 5.054 percent and from region 3 by 42.988 percent before the 5 percent wage hike in region 1. After the wage hike, the industries in region 2 import 4.973 percent of agricultural products from region 1 and 43.032 percent of those goods from region 3. All other industries follow the

same patterns; i.e., the industries in the region where wage is increased import more products from other region and purchase less inputs from own region. The trade coefficients change because of the wage hike.

Tables 18-21 in Appendix I provides similiar results when the wage or the service price of capital is hiked by 5 percent.

Chapter 6

Proposed Study on the Regional Economic Impact on the Arkansas Navigation System

We proposed the three region-forty sector variable input-output model to evaluate the economic impact of the Arkansas navigation system on regional and national economies. The forty industrial classification covers nine farms, seventeen manufacturing, three mining, one construction, one government and five service industries. This industrial classification covers every detail of industrial activities in the waterway regions.

We disaggregate the transportation industry into rail, motor, water and other transporation industries. This disaggregation permits us to investigate the modal choice behavior of the freight transportation. It is interesting to investigate how the energy efficient and cheaper waterway transportation affects the demands for rail or motor freight transportation.

The forty-sector industrial classification is as follows; the set of figures inside the parenthesis is the 1972 OBE code.

Agriculture

1.	Dairy farm products	(0101)
2.	Poultry and eggs	(0102)
3.	Meat animals and products	(0103)
4.	Cotton	(0201)
5.	Food and feed grains	(0202)
6.	Fruits and nuts	(0204)
7.	Vegetables and melons	(0205)
8.	Oil bearing crops	(0206)

9.	Misc. agricultural products, forestry and fishery	(0203, 0207, 0300, 0400)

Manufacturing

10.	Food and kindred products	(14,15)
11.	Apparel and textile products	(16-19)
12.	Lumber and wood products	(20,21)
13.	Furniture and fixture	(22,23)
14.	Paper and allied products	(24,25)
15.	Printing and publishing	(26)
16.	Chemical and allied products	(27-30)
17.	Petroleum and allied products	(31)
18.	Rubber	(32)
19.	Leather	(33,34)
20.	Stone, clay and glass products	(35,36)
21.	Primary metal products	(37,38)
22.	Fabricated metal	(39-42)
23.	Machinery except electrical	(43-52)
24.	Electrical equipments	(53-58)
25.	Motor vehicle & transp. equip.	(59-61)
26.	Misc. manufacturing	(13,62-64)

Minings

27.	Bituminous coal	(7)
28.	Crude petroleum & natural gas	(8)
29.	Other mining except petroleum, gas and coal	(5-6, 9-10)

Construction

30.	Contract construction	(11,12)

Transportation

31.	Railroads and related service	(6501)
32.	Motor freight transportation	(6503)
33.	Water transportation	(6504)
34.	Other transportation	(6502, 6505-6507)

Service

35.	Wholesale and retail trade	(69)
36.	Finance, insurance & real estate	(70,71)
37.	Communications, radio and TV broadcasting	(66,67)
38.	Electric, gas & sanitary services	(68)
39.	Hotel and other services	(72-77)

Government

40.	Government	(78,79,82)

*Dummy industries (81,82,83), non-government special industries (84,85), and the noncomparable imports (80) are reallocated by using the method suggested by McCarthy ["On the Aggregation of the 1958 Direct Requirements Input-Output Table," The Review of Economics and Statistics, XLIX, 4 (1967)].

The U.S. economy is disaggregated into three regions;

1. The waterway region which includes thirteen Oklahoma counties and fifteen Arkansas counties. These twenty-eight counties surround the Arkansas River Navigation System. The thirteen Oklahoma counties are Osage, Nowata, Rogers, Tulsa, Pawnee, Creek, Wagoner, Muskogee, McIntosh, Pittsburg, Haskell, Sequoyah and LeFlore. The fifteeen Arkansas counties are Crawford, Sebastian, Franklin, Johnson, Logan, Pope, Yell, Conway, Perry, Faulkner, Pulaski, Jefferson, Arkansas, Lincoln and Desha.

2. The nonwater region which includes Oklahoma and Arkansas other than the waterway region.
3. The rest of the U.S. which includes all other states except Oklahoma and Arkansas.

The multiregional variable input-output model requires a large amount of data:

1. Estimates of output, employment, payrolls, and value added for each region.
2. Estimates of regional technical coefficients.
3. Estimates of final demand for each region.
4. Estimates of transportation flows, region to region.
5. Estimates of the transportation cost change due to the Arkansas navigation system

Our regional classification requires county, state and national level of data. For example, region 1 consists of fourteen Oklahoma counties and fifteen Arkansas counties. Region 2 requires the Oklahoma and Arkansas state data since it is the rest of Oklahoma and Arkansas. Region 3 requires the national data. Region 3 includes all other states except Oklahoma and Arkansas.

It is essential to have controls at the national, state and county level to insure that all these data are consistent to each other.

(6.1) Estimates of Output, Employment, Payrolls, and Value Added

The four order BEA input-output table for 1972 has value added and output by each sector at national level. Also the 88 order BEA input-output table for 1972 disaggregates the value added into wage, nonwage and tax payment by each industry. Employment and payrolls are compiled from the Bureau of Labor Statistics, Employment and Earnings. The state and county data are

available from the Department of Commerce, The County Business Patterns.

We prorate the national data at state level and county level by using the most closely related variables. We explain one by one for agriculture, mining, manufacturing, government and other sectors.

(6.1.1) Agricultural Sector

We estimate the gross farm products for Oklahoma and Arkansas for the years of 1972-1977. For example, 1972 Oklahoma gross farm product was estimated as below:

Gross Farm Product of Oklahoma, 1972
(in million dollar)

		Amounts
1.	Cash receipts from marketing	1,395.0
2.	Value of home consumption	17.5
3.	Gross rental value of dwellings	70.2
	(Less: net rent to nonoperator landlords)	78.8
4.	Net change in inventories	34.2
5.	Value of total farm output (1+2+3+4)	1,438.1
6.	Purchase of raw materials	600.7
	Feed	215.3
	Livestock	318.4
	Seed	18.5
	Fertilizer	48.5
7.	Repairs and operation of equipment	118.7
8.	Miscellaneous operating expenses	189.9
9.	Total current expenses (6+7+8)	909.3
	Gross Farm product (5-9)	528.8

These gross farm products are prorated to each farm product by the percentage of cash receipts from marketing. For example, 1972 Oklahoma gross farm product is allocated to each farm industry as below;

	% of Cash Receipt from Marketing	Farm Value Added
Dairy farm products	5.3	28.02
Poultry and eggs	2.2	11.63
Meat animals and products	69.3	366.46
Cotton	2.8	14.81
Food and feed grains	15.0	79.32
Fruits and nuts	0.2	1.06
Vegetable and melons	0.5	2.64
Oil bearing crops	3.1	16.40
Miscellaneous agricultural products	1.6	8.46
Total	100.0	528.8

We allocate the 1972 Oklahoma farm value added between waterway counties and the rest of the state as follows;

1. We gathered the county data for the market value of agricultural products sold from 1974 U.S. Agricultural Census.

2. We aggregate the data for the Oklahoma water counties and computed the percentage of water counties to total Oklahoma. Using the percentage, we prorate the Oklahoma value added by each farm between the water counties and the rest of Oklahoma

Agricultural product sold	Percentage of the water counties to total Oklahoma in 1972 (%)
1. Crop and hay	5.5
2. Nursery and greenhouse products	24.4

Agricultural product sold	Percentage of the water counties to total Oklahoma in 1972 (%)
3. Forest products	4.6
4. Livestock except poultry	9.7
5. Poultry products	17.1

We estimate the agricultural outputs. The U.S. agricultural output by each farm industry is available from the 1972 U.S. transaction table. We allocate each farm output among the water region, the rest of Oklahoma and Arkansas, and the rest of U.S. We use the production data as the blow-up variable. For example, to estimate the Oklahoma water county output for meat animals and products, we collect the number of cattle in each of Oklahoma's water county. Then, we calculate the percentage of cattles in the water counties to total number of cattles in Oklahoma as the blow-up variables and divide the Oklahoma output for meat animals and products between the water county region and the rest of Oklahoma. In Oklahoma, the percentage of cash receipt by the cattle within the meat animal and product industry is approximately 96 percent. When more than one variable is available such as wheat, sorghum, hay for 'food and feed grains', their combined revenues are used as the blow-up variable.

The following table provides the quantity variables employed as the blow-up variable and their percentage of cash receipt from marketing within the industrial classification.

Oklahoma Agricultural Industries in 1972

Farm Industry	The blow-up quantity variable	The percentage of cash receipts*
Dairy farm products	milk cows	96%
Poultry and eggs	poultry	77.3%

Farm Industry	The blow-up quantity variable	The percentage of cash receipts*
Meat animal and products	cattle	95.7%
Cotton	cotton	100%
Food and feed grains	wheat, sorghum, hay	93.3%
Fruits and nuts	pecan	50.0%
Vegetable and melon	misc. veg. and melon	60.0%
Oil bearing crops	peanut	74.1%
Misc. agricultural products	greenhouse nursery	70.0%

*The percentage of cash receipts by the quantity variable within the industry group.

The 1972 OBE agricultural outputs by each sector is prorated into the state and county level by the blow-up variable.

The gross farm product which we calculated may not add up to the value added by agricultural sector in the 1972 OBE input-output table. We prorate the OBE value added by the farm industry into state and county level by using the gross farm product as a blow-up variable.

(6.1.2) Mining Sectors

The Mineral Yearbooks and 1972 Census of Mineral Industry provide production and revenue data at national and state level. They also report county statistics of mineral industries. However, the county data is either too aggregate or incomplete because many counties withheld their information. Instead, we use Oklahoma Tax Commission data. Oklahoma Tax Commission reports the value of oil and the value of natural gas on which gross production tax was paid. County coal production data was compiled from Oklahoma Department of Mines.

The 1972 OBE mineral output and value added are prorated into the state and county level by using production or value of production as the blow-up variables.

(6.1.3) Manufacturing, Government and Others

Annual Survey of Manufacturers and 1972 Census of Manufactures provide detail statistics on employment, wage payment, value added and value of shipment at national and state level. They also supply county statistics. However, county statistic is either too much aggregated or being withheld as confidential. Using the value of shipment as the blow-up variable, the 1972 OBE output data is prorated into state level. These state output data are one more time disaggregated into the county levels by using the payroll from the County Business Patterns as the blow-up variable.

State manufacturing statistics on wage and value added are disaggregated into the county level by using the payroll as the blow-up variable.

Employment at national, state and county level is obtained from the County Business Patterns.

Value added in government and other industries was estimated at state level for Oklahoma and for Arkansas by the method suggested by Kendrick and Jay Cox ["The Concept and Estimation of Gross State Product," The Southern Economic Journal XXXII, 2, 1965]. The values added which we estimated may not add up to the OBE value added. To maintain consistency with the 1972 OBE values added, those OBE data are prorated into state level by using the estimated value added as a blow-up variable. By using the county payroll data as a blow-up, the state value added is prorated into county level once more.

(6.2) Estimates of Regional Technical Coefficients

The 1972 input-output transaction table has 496 industrial classification. Instead of summing the columns and rows, we delete the industries which don't exist in the region. The County Business Pattern provides the industries located in each county. We screen the industries in waterway regions and nonwaterway

Oklahoma-Arkansas region. After deleting the industries which are not located in the region, we aggregate the remaining industries into the forty industries. Then, we calculate new set of technical coefficients, one for the waterway region, the other for the nonwaterway region and finally for the rest of U.S. These coefficients are all different because the number of deleting industries for each region is not the same. This type of aggregation is called a product mix method.

(6.3) Estimates of Final Demand for Each Region

Jack Faucett Associates forecasted the 1970 final demand at state level [Scheppach (31)]. The final demand includes consumer expenditures, private domestic capital expenditure, government expenditure, net export and inventory change.

Instead of reestimating the state final demand component, we use the 1970 forecasts as the base of our study. These state final demand is updated on the basis of the U.S. final demand data. We assume that Oklahoma and Arkansas share the same rates of growth in final demand as those of the U.S.

Each component of the final demand is prorated into the county level. We propose to use the following variables as the prorated variables.

Final Demand Component	The Prorated Variable
Consumption	County personal income
Investment	County industrial outputs
Government spending	Local government expenditures

The final demand coefficients of net export and inventory change are assumed to remain the same as the 1970 level.

(6.4) Estimates of Transportation Flows, Region to Region

Transportation flows on a county to county basis are most difficult to collect.

Unfortunately, Oklahoma and Arkansas are not among the census states selected for the previous Commodity Transportation Survey.

The 1977 Commodity Transportation Survey which includes manufacturing establishment in the 50 states and the District of Columbia are not available until early 1978.

We have the following four ways to estimate the trade coefficients between counties;

(1) A sample survey

(2) One percent sample of ICC railway bill compiled by the Federal Railroad Administration

(3) Army Corps of Engineer's freight transportation data

(4) Search for further information on trade coefficient.

(6.5) Estimates of the Transportation Cost Change Due to the Arkansas Navigation System

This information is expected to be supplied to us by other study.

The Appendix II presents the data collected during the phase I study to be used for the proposed study.

Chapter 7

Conclusion

Conventional multiregional input-output model assumes the fixed technical and fixed trade coefficients. These coefficients are invariant to the change in input prices, in output price, in wage rate, in service price of capital, and in tax rates. There is neither input substitution nor import substitution in response to those cost changes.

Casual observation doesn't support the hypothesis. The firms are sensitive to the cost change. To the firms, the technical coefficients are simply a ratio of the input and output, and the trade coefficients are percentage of the commodity purchased from a region. These coefficients should depend on the optimizing behavior of firms which the conventional input-output model fails to incorporate.

The variable input-output model grounds on the neoclassical theory of firms which allows firms to choose the input mix and the import so as to maximize their profits. The costs are the most sensitive variables in the optimizing decision. The purchase price of input, wage rates, land price, capital cost, tax rates, and the transportation cost are those costs which firms face in their optimizing process. Any change in these costs make the firms to change their input mix and the import decision. In this process, the technical coefficients and trade coefficients change.

Using the 1963 interregional flow data, we tested the workings of the multiregional variable input-output model. The model responds to the firms' optimizing behavior. Whenever a cost of input increases, there is a strong evidence for firms to substitute less expensive input for the expensive one.

An increase in transportation cost makes the firms to purchase more products within the local market. The import coefficients are noticeably declining

when a transportation cost is increased. When the transportation cost is lowered, it stimulates the local industries. Agricultural, mining, durable, and non-durable manufacturing industries are more sensitive to the transportation cost change. Service, trade, government, construction, and financial industries are relatively less sensitive to the transportation costs. The change in primary input prices such as wage and the service of capital affects the regional development. In general, the industries located in regions where the input prices are hiked are slowing down their growth rates. The wage hike in the small region such as region 1 virtually unaffects on the large region such as the rest of the U.S. However, the reverse is not true. There is a noticeable growth effect on the region 1 when the wage hike is introduced in the rest of the U.S. It is because of the import dependence of the region 1 on the rest of the U.S. is much larger than that of the rest of the U.S. on region 1.

We use private library so that all the subroutines are stored in the library and all data are stored in either disks file or tapes.

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APPENDIX I

Empirical Results of the Phase I Study

APPENDIX I: EMPIRICAL RESULTS

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TABLE 1

TRADE COEFFICIENTS OF SELECTED COMMODITIES BEFORE AND AFTER THE TRANSPORTATION COST CHANGE

NO CHANGE IN TRANSPORTATION COST				5% DECREASE IN TRANSPORTATION COST, REGION 1 AND REGION 2			
(1) Agricultural, Forestry, and Fisheries							
	I	II	III		I	II	III
I	0.30609	0.05054	0.01570	I	0.30295	0.05348	0.01586
II	0.33679	0.51958	0.05821	II	0.34728	0.51831	0.05828
III	0.35712	0.42988	0.92610	III	0.34977	0.42820	0.92586
(2) Mining							
	I	II	III		I	II	III
I	0.19380	0.01387	0.00994	I	0.18787	0.01463	0.00999
II	0.68742	0.85783	0.21834	II	0.69753	0.85722	0.21841
III	0.11878	0.12829	0.77171	III	0.11459	0.12814	0.77160
(3) Non-Durable Manufacturing							
	I	II	III		I	II	III
I	0.26370	0.04013	0.00718	I	0.26192	0.04261	0.00728
II	0.31782	0.61697	0.05066	II	0.32790	0.61565	0.05071
III	0.41848	0.34290	0.94216	III	0.41019	0.34174	0.94201
(4) Durable Manufacturing							
	I	II	III		I	II	III
I	0.18272	0.03776	0.00912	I	0.18180	0.03985	0.00918
II	0.19952	0.37564	0.02619	II	0.20755	0.37506	0.02622
III	0.61776	0.58660	0.96469	III	0.61065	0.58508	0.96460
(5) Finance, Insurance and Real Estates							
	I	II	III		I	II	III
I	0.84225	0.01617	0.00000	I	0.83718	0.01701	0.00000
II	0.12322	0.96959	0.00000	II	0.12856	0.96877	0.00000
III	0.03453	0.01424	1.00000	III	0.03426	0.01422	1.00000
(6) Service							
	I	II	III		I	II	III
I	0.70383	0.01354	0.00000	I	0.70019	0.01426	0.00000
II	0.11726	0.87269	0.00000	II	0.12234	0.87210	0.00000
III	0.17891	0.11377	1.00000	III	0.17747	0.11364	1.00000

TABLE 2

TRADE COEFFICIENTS OF SELECTED COMMODITIES
AFTER THE TRANSPORTATION COST CHANGE

5% DECREASE IN TRANSPORT. COST REGION 1&2 AND REGION 1&3				5% DECREASE IN TRANSPORT. COST ALL REGIONS			
(1) Agricultural, Forestry, and Fisheries							
	I	II	III		I	II	III
I	0.30003	0.05407	0.01684	I	0.29910	0.05267	0.01679
II	0.33995	0.51795	0.05821	II	0.34202	0.50914	0.06155
III	0.36002	0.42799	0.92494	III	0.35887	0.43820	0.92167
(2) Mining							
	I	II	III		I	II	III
I	0.18741	0.01469	0.01054	I	0.18709	0.01457	0.01041
II	0.69291	0.85717	0.21828	II	0.69337	0.85179	0.22723
III	0.11968	0.12814	0.77118	III	0.11956	0.13364	0.76236
(3) Non-Durable Manufacturing							
	I	II	III		I	II	III
I	0.25859	0.04305	0.00773	I	0.25789	0.04210	0.00770
II	0.32021	0.61532	0.05068	II	0.32188	0.60653	0.05352
III	0.42120	0.34163	0.94159	III	0.42023	0.35137	0.93878
(4) Durable Manufacturing							
	I	II	III		I	II	III
I	0.17819	0.04036	0.00977	I	0.17776	0.03901	0.00976
II	0.20077	0.37485	0.02620	II	0.20271	0.36673	0.02783
III	0.62104	0.58479	0.96403	III	0.61953	0.59425	0.96241
(5) Finance, Insurance and Real Estates							
	I	II	III		I	II	III
I	0.83598	0.01704	0.00000	I	0.83580	0.01700	0.00000
II	0.12812	0.96873	0.00000	II	0.12832	0.96808	0.00000
III	0.03589	0.01422	1.00000	III	0.03588	0.01492	1.00000
(6) Service							
	I	II	III		I	II	III
I	0.69480	0.01432	0.00000	I	0.69451	0.01419	0.00000
II	0.12087	0.87205	0.00000	II	0.12125	0.86742	0.00000
III	0.18433	0.11363	1.00000	III	0.18424	0.11839	1.00000

TABLE 3

TRADE COEFFICIENTS OF SELECTED COMMODITIES AFTER THE TRANSPORTATION COST CHANGE

10% DECREASE IN TRANSPORT. COST REGION 1 AND REGION 2				10% DECREASE IN TRANSPORT. COST REGION 1&2 AND REGION 1&3			
(1) Agricultural, Forestry, and Fisheries							
	I	II	III		I	II	III
I	0.29970	0.05659	0.01602	I	0.29403	0.05783	0.01808
II	0.35791	0.51696	0.05835	II	0.34309	0.51618	0.05821
III	0.34239	0.42646	0.92563	III	0.36288	0.42599	0.92372
(2) Mining							
	I	II	III		I	II	III
I	0.18202	0.01543	0.01003	I	0.18119	0.01557	0.01118
II	0.70747	0.85658	0.21848	II	0.69826	0.85644	0.21820
III	0.11050	0.12799	0.77148	III	0.12056	0.12799	0.77062
(3) Non-Durable Manufacturing							
	I	II	III		I	II	III
I	0.26002	0.04523	0.00737	I	0.25355	0.04617	0.00832
II	0.33812	0.61424	0.05077	II	0.32258	0.61354	0.05070
III	0.40186	0.34054	0.94186	III	0.42388	0.34029	0.94099
(4) Durable Manufacturing							
	I	II	III		I	II	III
I	0.18081	0.04206	0.00924	I	0.17374	0.04312	0.01047
II	0.21582	0.37445	0.02624	II	0.20201	0.37399	0.02620
III	0.60337	0.58350	0.96452	III	0.62425	0.58288	0.96332
(5) Finance, Insurance and Real Estates							
	I	II	III		I	II	III
I	0.83192	0.01789	0.00000	I	0.82952	0.01796	0.00000
II	0.13410	0.96790	0.00000	II	0.13318	0.96783	0.00000
III	0.03398	0.01421	1.00000	III	0.03730	0.01421	1.00000
(6) Service							
	I	II	III		I	II	III
I	0.69640	0.01502	0.00000	I	0.68562	0.01514	0.00000
II	0.12760	0.87148	0.00000	II	0.12454	0.87137	0.00000
III	0.17600	0.11351	1.00000	III	0.18984	0.11349	1.00000

TABLE 4

TRADE COEFFICIENTS OF SELECTED COMMODITIES
AFTER THE TRANSPORTATION COST CHANGE

20% DECREASE IN TRANSPORT. COST REGION 1 AND REGION 2				20% DECREASE IN TRANSPORT. COST REGION 1&2 AND REGION 1&3			
(1) Agricultural, Forestry, and Fisheries							
	I	II	III		I	II	III
I	0.29283	0.06331	0.01635	I	0.28225	0.06610	0.02081
II	0.37957	0.51395	0.05849	II	0.34926	0.51224	0.05818
III	0.32760	0.42274	0.92516	III	0.36848	0.42167	0.92101
(2) Mining							
	I	II	III		I	II	III
I	0.17064	0.81718	0.01013	I	0.16922	0.01747	0.01256
II	0.72673	0.85517	0.21862	II	0.70854	0.85488	0.21803
III	0.10262	0.12766	0.77126	III	0.12223	0.12766	0.76942
(3) Non-Durable Manufacturing							
	I	II	III		I	II	III
I	0.25588	0.05094	0.00757	I	0.24366	0.05308	0.00963
II	0.35900	0.61110	0.05087	II	0.32723	0.60954	0.05073
III	0.38512	0.33797	0.94156	III	0.42912	0.33738	0.93964
(4) Durable Manufacturing							
	I	II	III		I	II	III
I	0.17863	0.04682	0.00936	I	0.16512	0.04921	0.01202
II	0.23306	0.37306	0.02629	II	0.20442	0.37206	0.02621
III	0.58831	0.58011	0.96435	III	0.63046	0.57873	0.96177
(5) Finance, Insurance and Real Estates							
	I	II	III		I	II	III
I	0.82082	0.01980	0.00000	I	0.81599	0.01995	0.00000
II	0.14577	0.96603	0.00000	II	0.14377	0.96588	0.00000
III	0.03340	0.01417	1.00000	III	0.04024	0.01417	1.00000
(6) Service							
	I	II	III		I	II	III
I	0.68834	0.01665	0.00000	I	0.66681	0.01694	0.00000
II	0.13871	0.87013	0.00000	II	0.13207	0.86987	0.00000
III	0.17295	0.11322	1.00000	III	0.20112	0.11319	1.00000

TABLE 5

TRADE COEFFICIENTS OF SELECTED COMMODITIES BEFORE AND AFTER THE TRANSPORTATION COST CHANGE

NO CHANGE IN TRANSPORTATION COST				5% INCREASE IN TRANSPORT. COST REGION 1 AND REGION 2			
(1) Agricultural, Forestry, and Fisheries							
	I	II	III		I	II	III
I	0.30609	0.05054	0.01570	I	0.30910	0.04775	0.01554
II	0.33679	0.51958	0.05821	II	0.32646	0.52076	0.05814
III	0.35712	0.42988	0.92610	III	0.36444	0.43149	0.92633
(2) Mining							
	I	II	III		I	II	III
I	0.19380	0.01387	0.00994	I	0.19983	0.01314	0.00990
II	0.68742	0.85783	0.21834	II	0.67712	0.85841	0.21828
III	0.11878	0.12829	0.77171	III	0.12306	0.12844	0.77182
(3) Non-Durable Manufacturing							
	I	II	III		I	II	III
I	0.26370	0.04013	0.00718	I	0.26536	0.03779	0.00709
II	0.31782	0.61697	0.05066	II	0.30790	0.61821	0.05060
III	0.41848	0.34290	0.94216	III	0.42673	0.34400	0.94231
(4) Durable Manufacturing							
	I	II	III		I	II	III
I	0.18272	0.03776	0.00912	I	0.18357	0.03577	0.00906
II	0.19952	0.37564	0.02619	II	0.19172	0.37617	0.02616
III	0.61776	0.58660	0.96469	III	0.62471	0.58805	0.96477
(5) Finance, Insurance and Real Estates							
	I	II	III		I	II	III
I	0.84225	0.01617	0.00000	I	0.84713	0.01537	0.00000
II	0.12322	0.96959	0.00000	II	0.11807	0.97037	0.00000
III	0.03453	0.01424	1.00000	III	0.03479	0.01426	1.00000
(6) Service							
	I	II	III		I	II	III
I	0.70383	0.01354	0.00000	I	0.70732	0.01286	0.00000
II	0.11726	0.87269	0.00000	II	0.11237	0.87325	0.00000
III	0.17891	0.11377	1.00000	III	0.18032	0.11390	1.00000

TABLE 6

TRADE COEFFICIENTS OF SELECTED COMMODITIES
AFTER THE TRANSPORTATION COST CHANGE

	5% INCREASE IN TRANSPORT COST REGION 1&2 AND REGION 1&3				5% INCREASE IN TRANSPORT COST ALL REGIONS		
(1) Agricultural, Forestry, and Fisheries							
	I	II	III		I	II	III
I	0.31222	0.04723	0.01462	I	0.31316	0.04848	0.01467
II	0.33360	0.52109	0.05820	II	0.33155	0.53000	0.05504
III	0.35418	0.43168	0.92717	III	0.35529	0.42152	0.93029
(2) Mining							
	I	II	III		I	II	III
I	0.20036	0.01309	0.00938	I	0.20071	0.01320	0.00949
II	0.68179	0.85847	0.21840	II	0.68132	0.86368	0.20970
III	0.11784	0.12843	0.77221	III	0.11797	0.12312	0.78080
(3) Non-Durable Manufacturing							
	I	II	III		I	II	III
I	0.26887	0.03740	0.00667	I	0.26959	0.03823	0.00670
II	0.31540	0.61850	0.05063	II	0.31375	0.62730	0.04794
III	0.41572	0.34410	0.94269	III	0.41666	0.33447	0.94536
(4) Durable Manufacturing							
	I	II	III		I	II	III
I	0.18734	0.03532	0.00852	I	0.18778	0.03654	0.00853
II	0.19824	0.37637	0.02618	II	0.19634	0.38463	0.02464
III	0.61442	0.58831	0.96530	III	0.61589	0.57884	0.96683
(5) Finance, Insurance and Real Estates							
	I	II	III		I	II	III
I	0.84832	0.01534	0.00000	I	0.84849	0.01538	0.00000
II	0.11847	0.97040	0.00000	II	0.11829	0.97103	0.00000
III	0.03321	0.01426	1.00000	III	0.03322	0.01359	1.00000
(6) Service							
	I	II	III		I	II	III
I	0.71270	0.01280	0.00000	I	0.71298	0.01291	0.00000
II	0.11371	0.87330	0.00000	II	0.11335	0.87778	0.00000
III	0.17358	0.11390	1.00000	III	0.17367	0.10930	1.00000

TABLE 7

TRADE COEFFICIENTS OF SELECTED COMMODITIES
AFTER THE TRANSPORTATION COST CHANGE

	10% INCREASE IN TRANSPORT. COST REGION 1 AND REGION 2				10% INCREASE IN TRANSPORT. COST REGION 1&2 AND REGION 1&3		
(1) Agricultural, Forestry, and Fisheries							
	I	II	III		I	II	III
I	0.31199	0.04511	0.01538	I	0.31842	0.04413	0.01362
II	0.31628	0.52186	0.05807	II	0.33038	0.52249	0.05819
III	0.37173	0.43303	0.92656	III	0.35120	0.43338	0.92818
(2) Mining							
	I	II	III		I	II	III
I	0.20594	0.81246	0.00986	I	0.20708	0.01236	0.00886
II	0.66664	0.85897	0.21821	II	0.67602	0.85907	0.21846
III	0.12741	0.12858	0.77193	III	0.11690	0.12858	0.77269
(3) Non-Durable Manufacturing							
	I	II	III		I	II	III
I	0.26691	0.03559	0.00700	I	0.27411	0.03485	0.00620
II	0.29815	0.61935	0.05055	II	0.31296	0.61992	0.05061
III	0.43494	0.34506	0.94245	III	0.41293	0.34524	0.94319
(4) Durable Manufacturing							
	I	II	III		I	II	III
I	0.18435	0.03389	0.00901	I	0.19205	0.03304	0.00795
II	0.18415	0.37667	0.02614	II	0.19695	0.37703	0.02617
III	0.63150	0.58945	0.96486	III	0.61100	0.58993	0.96588
(5) Finance, Insurance and Real Estates							
	I	II	III		I	II	III
I	0.85183	0.01461	0.00000	I	0.85419	0.01455	0.00000
II	0.11311	0.97112	0.00000	II	0.11388	0.97118	0.00000
III	0.03505	0.01427	1.00000	III	0.03193	0.01427	1.00000
(6) Service							
	I	II	III		I	II	III
I	0.71065	0.01221	0.00000	I	0.72142	0.01210	0.00000
II	0.10765	0.87377	0.00000	II	0.11023	0.87387	0.00000
III	0.18170	0.11402	1.00000	III	0.16835	0.11403	1.00000

TABLE 8

TRADE COEFFICIENTS OF SELECTED COMMODITIES
AFTER THE TRANSPORTATION COST CHANGE

	20% INCREASE IN TRANSPORT. COST REGION 1 AND REGION 2				20% INCREASE IN TRANSPORT. COST REGION 1&2 AND REGION 1&3		
(1) Agricultural, Forestry, and Fisheries							
	I	II	III		I	II	III
I	0.31738	0.04024	0.01506	I	0.33101	0.03850	0.01182
II	0.29644	0.52382	0.05793	II	0.32385	0.52497	0.05816
III	0.38618	0.43594	0.92701	III	0.34514	0.43654	0.93002
(2) Mining							
	I	II	III		I	II	III
I	0.21840	0.01119	0.00977	I	0.22101	0.01100	0.00788
II	0.64519	0.85997	0.21807	II	0.66408	0.86016	0.21854
III	0.13641	0.12884	0.77217	III	0.11492	0.12883	0.77358
(3) Non-Durable Manufacturing							
	I	II	III		I	II	III
I	0.26964	0.03154	0.00682	I	0.28477	0.03024	0.00535
II	0.27917	0.62140	0.05044	II	0.30801	0.62242	0.05055
III	0.45119	0.34706	0.94274	III	0.40722	0.34734	0.94409
(4) Durable Manufacturing							
	I	II	III		I	II	III
I	0.18571	0.03040	0.00889	I	0.20174	0.02889	0.00692
II	0.16972	0.37754	0.02609	II	0.19430	0.37819	0.02615
III	0.64457	0.59207	0.96502	III	0.60397	0.59291	0.96693
(5) Finance, Insurance and Real Estates							
	I	II	III		I	II	III
I	0.86072	0.01320	0.00000	I	0.86538	0.01309	0.00000
II	0.10374	0.97250	0.00000	II	0.10513	0.97260	0.00000
III	0.03555	0.01430	1.00000	III	0.02950	0.01430	1.00000
(6) Service							
	I	II	III		I	II	III
I	0.71690	0.01100	0.00000	I	0.73835	0.01082	0.00000
II	0.09874	0.87474	0.00000	II	0.10347	0.87491	0.00000
III	0.18436	0.11425	1.00000	III	0.15818	0.11427	1.00000

TABLE 9

DEVELOPMENT AND INFLATION IMPACT OF
A 5% DECREASE IN TRANSPORTATION COSTS
(unit: percent)

	Region 1 and 2		Reg. 1&2 & Reg. 1&3		All Regions	
	Output	Price	Output	Price	Output	Price
Region 1						
Agriculture, Forestry	2.941	-1.068	8.966	-2.271	9.777	-2.562
Mining	2.372	-0.478	6.568	-0.911	6.890	-0.984
Construction	0.787	-0.643	2.359	-1.889	2.582	-2.073
Non-Durable Mfg.	2.989	-1.339	7.015	-2.465	7.534	-2.727
Durable Mfg.	2.147	-0.664	8.559	-2.012	8.980	-2.200
Transportation, Utility	0.565	-0.298	1.637	-0.587	1.703	-0.636
Trade	0.299	-0.194	0.894	-0.404	0.928	-0.437
Finance, Insurance	0.788	-0.186	1.421	-0.389	1.564	-0.419
Service	0.791	-0.293	1.785	-0.737	1.900	-0.803
Government	0.353	-0.231	0.887	-0.522	0.947	-0.568
Region 2						
Agriculture, Forestry	0.531	-0.164	0.717	-0.207	5.501	-1.413
Mining	0.286	-0.050	0.362	-0.059	3.404	-0.374
Construction	0.167	-0.135	0.217	-0.175	2.108	-1.662
Non-Durable Mfg.	0.277	-0.138	0.346	-0.170	3.248	-1.225
Durable Mfg.	0.313	-0.114	0.414	-0.150	4.857	-1.538
Transportation, Utility	0.060	-0.035	0.077	-0.043	0.800	-0.343
Trade	0.038	-0.031	0.046	-0.036	0.360	-0.235
Finance, Insurance	0.125	-0.032	0.156	-0.037	1.078	-0.242
Service	0.114	-0.050	0.142	-0.061	0.920	-0.483
Government	0.050	-0.036	0.063	-0.045	0.544	-0.365
Region 3						
Agriculture, Forestry	0.028	-0.017	0.166	-0.081	0.783	-0.361
Mining	0.002	-0.004	0.043	-0.020	0.525	-0.165
Construction	0.010	-0.009	0.055	-0.049	0.260	-0.228
Non-Durable Mfg.	0.019	-0.016	0.099	-0.068	0.562	-0.373
Durable Mfg.	0.010	-0.008	0.086	-0.052	0.437	-0.234
Transportation, Utility	0.001	-0.003	0.009	-0.013	0.104	-0.098
Trade	0.000	-0.002	0.002	-0.007	0.021	-0.039
Finance, Insurance	0.000	-0.001	0.005	-0.007	0.033	-0.034
Service	0.002	-0.003	0.016	-0.014	0.086	-0.070
Government	0.002	-0.003	0.012	-0.013	0.084	-0.081

TABLE 10

REGIONAL DEVELOPMENT IMPACT OF TRANSPORTATION COSTS
(unit: percent)

	10% Decrease in Transportation Cost		20% Decrease in Transportation Cost	
	Region 1&2	Region 1&2 & 1&3	Region 1&2	Region 1&2 & 1&3
Region 1				
Agriculture, Forestry	6.018	18.820	12.610	41.540
Mining	4.864	13.610	10.230	29.280
Construction	1.587	4.800	3.224	9.941
Non-Durable Mfg.	6.121	14.680	12.850	32.230
Durable Mfg.	4.383	17.910	9.139	39.310
Transportation, Utility	1.150	3.367	2.387	7.131
Trade	0.609	1.836	1.262	3.870
Finance, Insurance	1.615	2.920	3.393	6.169
Service	1.615	3.663	3.372	7.722
Government	0.714	1.806	1.467	3.750
Region 2				
Agriculture, Forestry	1.082	1.480	2.254	3.163
Mining	0.588	0.757	1.244	1.655
Construction	0.336	0.438	0.679	0.889
Non-Durable Mfg.	0.561	0.707	1.152	1.476
Durable Mfg.	0.636	0.849	1.316	1.795
Transportation, Utility	0.123	0.160	0.260	0.348
Trade	0.077	0.095	0.161	0.204
Finance, Insurance	0.257	0.325	0.544	0.709
Service	0.233	0.293	0.487	0.624
Government	0.102	0.129	0.209	0.270
Region 3				
Agriculture, Forestry	0.057	0.340	0.118	0.715
Mining	0.004	0.091	0.012	0.204
Construction	0.019	0.111	0.038	0.222
Non-Durable Mfg.	0.038	0.202	0.078	0.415
Durable Mfg.	0.021	0.176	0.043	0.366
Transportation, Utility	0.001	0.019	0.003	0.042
Trade	0.000	0.005	0.001	0.013
Finance, Insurance	0.001	0.011	0.002	0.025
Service	0.004	0.032	0.008	0.069
Government	0.004	0.024	0.008	0.049

TABLE 11

DEVELOPMENT AND INFLATION IMPACT OF
A 5% INCREASE IN TRANSPORTATION COSTS
(unit: percent)

	Region 1 and 2		Reg 1&2 & Reg 1&3		All Regions	
	Output	Price	Output	Price	Output	Price
Region 1						
Agriculture, Forestry	-2.814	1.068	-8.165	2.271	-8.809	2.562
Mining	-2.260	0.478	-6.124	0.911	-6.373	0.984
Construction	-0.776	0.643	-2.283	1.889	-2.490	2.073
Non-Durable Mfg.	-2.855	1.339	-6.427	2.465	-6.850	2.727
Durable Mfg.	-2.064	0.664	-7.835	2.012	-8.170	2.200
Transportation, Utility	-0.545	0.298	-1.550	0.587	-1.604	0.636
Trade	-0.290	0.194	-0.850	0.404	-0.877	0.437
Finance, Insurance	-0.752	0.186	-1.349	0.389	-1.467	0.419
Service	-0.760	0.293	-1.699	0.737	-1.796	0.803
Government	-0.344	0.231	-0.856	0.522	-0.911	0.568
Region 2						
Agriculture, Forestry	-0.511	0.164	-0.676	0.207	-5.097	1.413
Mining	-0.271	0.050	-0.333	0.059	-3.189	0.374
Construction	-0.166	0.135	-0.215	0.175	-2.044	1.662
Non-Durable Mfg.	-0.270	0.138	-0.333	0.170	-3.059	1.225
Durable Mfg.	-0.303	0.114	-0.394	0.150	-4.521	1.538
Transportation, Utility	-0.057	0.035	-0.071	0.043	-0.754	0.343
Trade	-0.037	0.031	-0.043	0.036	-0.339	0.235
Finance, Insurance	-0.119	0.032	-0.144	0.037	-1.013	0.242
Service	-0.110	0.050	-0.134	0.061	-0.878	0.483
Government	-0.049	0.036	-0.061	0.045	-0.527	0.365
Region 3						
Agriculture, Forestry	-0.027	0.017	-0.159	0.081	-0.746	0.361
Mining	-0.001	0.004	-0.038	0.020	-0.491	0.165
Construction	-0.010	0.009	-0.055	0.049	-0.258	0.228
Non-Durable Mfg.	-0.019	0.016	-0.097	0.068	-0.548	0.373
Durable Mfg.	-0.010	0.008	-0.083	0.052	-0.421	0.234
Transportation, Utility	-0.000	0.003	-0.008	0.013	-0.099	0.098
Trade	-0.000	0.002	-0.002	0.007	-0.019	0.039
Finance, Insurance	-0.000	0.001	-0.005	0.007	-0.030	0.034
Service	-0.002	0.003	-0.015	0.014	-0.082	0.070
Government	-0.002	0.003	-0.011	0.013	-0.083	0.081

TABLE 12

REGIONAL DEVELOPMENT IMPACT OF TRANSPORTATION COSTS
(unit: percent)

	10% Increase in Transportation Cost		20% Increase in Transportation Cost	
	Region 1&2	Region 1&2 & 1&3	Region 1&2	Region 1&2 & 1&3
Region 1				
Agriculture, Forestry	-5.509	-15.600	-10.570	-28.560
Mining	-4.414	-11.830	-8.429	-22.130
Construction	-1.540	-4.494	-3.036	-8.713
Non-Durable Mfg.	-5.585	-12.320	-10.700	-22.700
Durable Mfg.	-4.050	-15.010	-7.805	-27.600
Transportation, Utility	-1.072	-3.018	-2.073	-5.726
Trade	-0.570	-1.658	-1.105	-3.158
Finance, Insurance	-1.470	-2.629	-2.812	-5.002
Service	-1.489	-3.316	-2.866	-6.328
Government	-0.680	-1.684	-1.328	-3.258
Region 2				
Agriculture, Forestry	-1.005	-1.314	-1.943	-2.493
Mining	-0.528	-0.640	-1.004	-1.185
Construction	-0.330	-0.426	-0.655	-0.843
Non-Durable Mfg.	-0.534	-0.655	-1.045	-1.267
Durable Mfg.	-0.597	-0.770	-1.160	-1.474
Transportation, Utility	-0.112	-0.137	-0.214	-0.256
Trade	-0.072	-0.084	-0.139	-0.159
Finance, Insurance	-0.231	-0.277	-0.439	-0.514
Service	-0.215	-0.261	-0.415	-0.495
Government	-0.097	-0.120	-0.189	-0.231
Region 3				
Agriculture, Forestry	-0.054	-0.312	-0.104	-0.601
Mining	-0.002	-0.072	-0.001	-0.129
Construction	-0.019	-0.110	-0.038	-0.219
Non-Durable Mfg.	-0.037	-0.192	-0.073	-0.376
Durable Mfg.	-0.020	-0.163	-0.038	-0.317
Transportation, Utility	-0.001	-0.015	-0.001	-0.027
Trade	-0.000	-0.003	-0.000	-0.005
Finance, Insurance	-0.000	-0.009	-0.000	-0.016
Service	-0.003	-0.029	-0.006	-0.055
Government	-0.004	-0.023	-0.007	-0.044

TABLE 13

Deflation and Growth Impact of Transportation Costs
A 5 Percent Decrease in Transportation Costs
(Unit: percent)

	Region 1 and 2 only		All Regions	
	Output Change	Price Change	Output Change	Price Change
Region 1				
Agriculture	2.94	-1.07	9.78	-2.56
Mining	2.37	- .48	6.89	- .98
Construction	.79	- .64	2.58	-2.07
Nondurable Mfg.	2.99	-1.34	7.53	-2.73
Durable Mfg.	2.15	- .66	8.98	-2.20
Trans - CU	.57	- .30	1.70	- .64
Trade	.30	- .19	.93	- .44
Financial	.79	- .19	1.56	- .42
Service	.79	- .29	1.90	- .80
Government	.35	- .23	.95	- .57
Region 2				
Agriculture	.53	- .16	5.50	-1.41
Mining	.29	- .05	3.40	- .37
Construction	.17	- .14	2.11	-1.66
Nondurable Mfg.	.28	- .14	3.25	-1.23
Durable Mfg.	.31	- .11	4.86	-1.54
Trans - CU	.06	- .04	.80	- .34
Trade	.04	- .03	.36	- .24
Financial	.13	- .03	1.08	- .24
Service	.11	- .05	.92	- .48
Government	.05	- .04	.54	- .37
Region 3				
Agriculture	.03	- .02	.78	- .36
Mining	.00*	- .00*	.53	- .17
Construction	.01	- .01	.26	- .23
Nondurable Mfg.	.02	- .02	.56	- .37
Durable Mfg.	.01	- .01	.44	- .23
Trans - CU	.00*	- .00*	.10	- .10
Trade	.00*	- .00*	.02	- .04
Financial	.00*	- .00*	.03	- .03
Service	.00*	- .00*	.09	- .07
Government	.00*	- .00*	.08	- .08

*Change smaller than 0.005

TABLE 14

Regional Development Impact of Wage Change
(unit: percent)

	A Five Percent Increase in Wage Rate in		
	Region 1	Region 2	Region 3
Region 1			
Agriculture, Forestry	-3.155	-0.595	0.729
Mining	-4.830	0.125	1.809
Construction	-1.948	-0.317	-0.788
Non-Durable Mfg.	-2.455	-0.765	0.182
Durable Mfg.	-3.422	-0.251	0.668
Transportation, Utility	-3.337	-0.034	0.394
Trade	-3.182	-0.016	0.227
Finance, Insurance	-3.362	0.125	0.274
Service	-3.105	0.041	0.076
Government	-2.932	-0.063	-0.008
Region 2			
Agriculture, Forestry	-0.047	-3.513	0.561
Mining	0.016	-4.483	1.559
Construction	-0.047	-2.168	-0.836
Non-Durable Mfg.	-0.040	-3.074	0.096
Durable Mfg.	-0.030	-3.137	0.154
Transportation, Utility	0.002	-3.282	0.297
Trade	-0.004	-3.121	0.146
Finance, Insurance	0.013	-3.455	0.484
Service	0.001	-3.067	0.073
Government	-0.007	-2.960	-0.038
Region 3			
Agriculture, Forestry	-0.016	-0.042	-2.977
Mining	0.007	0.056	-3.056
Construction	-0.013	-0.077	-2.945
Non-Durable Mfg.	-0.015	-0.110	-2.915
Durable Mfg.	-0.010	-0.026	-2.995
Transportation, Utility	0.001	-0.010	-2.990
Trade	0.001	0.010	-2.998
Finance, Insurance	0.001	0.011	-3.004
Service	0.000	0.007	-3.007
Government	-0.002	-0.021	-2.986

TABLE 15

Regional Development Impact of Service Price of Capital
(unit: percent)

	A Five Percent Increase in Service Price of Capital in		
	Region 1	Region 2	Region 3
Region 1			
Agriculture, Forestry	-1.853	-0.348	0.423
Mining	-2.847	0.072	1.050
Construction	-1.141	-0.185	-0.461
Non-Durable Mfg.	-1.440	-0.448	0.105
Durable Mfg.	-2.011	-0.148	0.388
Transportation, Utility	-1.962	-0.020	0.228
Trade	-1.870	-0.010	0.131
Finance, Insurance	-1.977	0.072	0.159
Service	-1.825	0.023	0.044
Government	-1.721	-0.037	-0.005
Region 2			
Agriculture, Forestry	-0.027	-2.066	0.325
Mining	0.010	-2.642	0.905
Construction	-0.027	-1.271	-0.489
Non-Durable Mfg.	-0.024	-1.806	0.054
Durable Mfg.	-0.018	-1.843	0.089
Transportation, Utility	0.001	-1.929	0.172
Trade	-0.002	-1.833	0.085
Finance, Insurance	0.008	-2.031	0.280
Service	0.001	-1.801	0.042
Government	-0.004	-1.738	-0.023
Region 3			
Agriculture, Forestry	-0.009	-0.025	-1.748
Mining	0.004	0.032	-1.795
Construction	-0.008	-0.045	-1.729
Non-Durable Mfg.	-0.009	-0.064	-1.711
Durable Mfg.	-0.006	-0.015	-1.758
Transportation, Utility	0.001	-0.006	-1.755
Trade	0.001	0.006	-1.760
Finance, Insurance	0.001	0.007	-1.764
Service	0.000	0.004	-1.765
Government	-0.001	-0.012	-1.753

TABLE 16

Regional Inflation Impact of Wage Change
(unit: percent)

	A Five Percent Increase in Wage Rate in		
	Region 1	Region 2	Region 3
Region 1			
Agriculture, Forestry	1.732	0.524	0.826
Mining	2.512	0.260	0.288
Construction	1.941	0.323	0.811
Non-Durable Mfg.	1.609	0.701	0.771
Durable Mfg.	1.866	0.335	0.874
Transportation, Utility	2.702	0.161	0.192
Trade	2.797	0.104	0.139
Finance, Insurance	2.808	0.101	0.133
Service	2.610	0.153	0.290
Government	2.740	0.122	0.192
Region 2			
Agriculture, Forestry	0.051	2.334	0.692
Mining	0.021	2.850	0.184
Construction	0.046	2.166	0.866
Non-Durable Mfg.	0.045	2.426	0.606
Durable Mfg.	0.041	2.223	0.811
Transportation, Utility	0.013	2.867	0.174
Trade	0.012	2.913	0.116
Finance, Insurance	0.013	2.910	0.120
Service	0.018	2.788	0.246
Government	0.013	2.855	0.187
Region 3			
Agriculture, Forestry	0.019	0.114	2.946
Mining	0.006	0.070	2.981
Construction	0.013	0.074	2.989
Non-Durable Mfg.	0.017	0.131	2.933
Durable Mfg.	0.014	0.075	2.987
Transportation, Utility	0.004	0.041	3.008
Trade	0.002	0.014	3.025
Finance, Insurance	0.002	0.012	3.030
Service	0.003	0.023	3.024
Government	0.003	0.031	3.020

TABLE 17

Regional Inflation Impact of Service Price of Capital
(unit: percent)

	A Five Percent Increase in Service Price of Capital in		
	Region 1	Region 2	Region 3
Region 1			
Agriculture, Forestry	1.010	0.306	0.482
Mining	1.465	0.151	0.168
Construction	1.133	0.189	0.473
Non-Durable Mfg.	0.938	0.409	0.450
Durable Mfg.	1.089	0.196	0.510
Transportation, Utility	1.576	0.094	0.112
Trade	1.632	0.061	0.081
Finance, Insurance	1.638	0.059	0.078
Service	1.523	0.089	0.169
Government	1.598	0.071	0.112
Region 2			
Agriculture, Forestry	0.030	1.361	0.404
Mining	0.012	1.662	0.108
Construction	0.027	1.263	0.505
Non-Durable Mfg.	0.026	1.415	0.354
Durable Mfg.	0.024	1.297	0.473
Transportation, Utility	0.008	1.672	0.102
Trade	0.007	1.699	0.067
Finance, Insurance	0.008	1.698	0.070
Service	0.011	1.627	0.143
Government	0.008	1.665	0.109
Region 3			
Agriculture, Forestry	0.011	0.067	1.719
Mining	0.004	0.041	1.739
Construction	0.007	0.043	1.744
Non-Durable Mfg.	0.010	0.076	1.711
Durable Mfg.	0.008	0.044	1.742
Transportation, Utility	0.002	0.024	1.755
Trade	0.001	0.008	1.765
Finance, Insurance	0.001	0.007	1.767
Service	0.002	0.014	1.764
Government	0.002	0.018	1.762

TABLE 18

IMPACT ON TRADE COEFFICIENTS BEFORE
AND AFTER THE FIVE PERCENT WAGE RATE CHANGE

NO CHANGE IN WAGE RATE				5% INCREASE IN WAGE RATE			
				REGION 1			
(1) Agricultural, Forestry, and Fisheries							
	I	II	III		I	II	III
I	0.30609	0.05054	0.01570	I	0.30250	0.04973	0.01543
II	0.33679	0.51958	0.05821	II	0.33848	0.51995	0.05821
III	0.35712	0.42988	0.92610	III	0.35902	0.43032	0.92636
(2) Mining							
	I	II	III		I	II	III
I	0.17442	0.01248	0.00895	I	0.17095	0.01218	0.00873
II	0.61868	0.77205	0.19651	II	0.62163	0.77230	0.19654
III	0.10690	0.11546	0.69454	III	0.10742	0.11552	0.69473
(3) Non-Durable Manufacturing							
	I	II	III		I	II	III
I	0.26370	0.04013	0.00718	I	0.26064	0.03953	0.00707
II	0.31782	0.61697	0.05066	II	0.31909	0.61730	0.05065
III	0.41848	0.34290	0.94216	III	0.42027	0.34317	0.94228
(4) Durable Manufacturing							
	I	II	III		I	II	III
I	0.18272	0.03776	0.00912	I	0.17998	0.03710	0.00896
II	0.19952	0.37564	0.02619	II	0.20015	0.37584	0.02619
III	0.61776	0.58660	0.96469	III	0.61988	0.58707	0.96486
(5) Finance, Insurance and Real Estates							
	I	II	III		I	II	III
I	0.84225	0.01617	0.00000	I	0.83850	0.01573	0.00000
II	0.12322	0.96959	0.00000	II	0.12615	0.97002	0.00000
III	0.03453	0.01424	1.00000	III	0.03535	0.01425	1.00000
(6) Service							
	I	II	III		I	II	III
I	0.70383	0.01354	0.00000	I	0.69838	0.01320	0.00000
II	0.11726	0.87269	0.00000	II	0.11941	0.87298	0.00000
III	0.17891	0.11377	1.00000	III	0.18221	0.11382	1.00000

TABLE 19

IMPACT ON TRADE COEFFICIENTS AFTER
THE FIVE PERCENT WAGE RATE CHANGE

5% INCREASE IN WAGE RATE — REGION 2				5% INCREASE IN WAGE RATE — REGION 3			
(1) Agricultural, Forestry, and Fisheries							
	I	II	III		I	II	III
I	0.30750	0.05093	0.01565	I	0.30826	0.05096	0.01681
II	0.33227	0.51415	0.05701	II	0.33963	0.52464	0.05944
III	0.36023	0.43493	0.92734	III	0.35211	0.42439	0.92456
(2) Mining							
	I	II	III		I	II	III
I	0.17750	0.01276	0.00899	I	0.17485	0.01251	0.00914
II	0.61350	0.76899	0.19228	II	0.62084	0.77481	0.20079
III	0.10899	0.11825	0.69873	III	0.10431	0.11268	0.69008
(3) Non-Durable Manufacturing							
	I	II	III		I	II	III
I	0.26451	0.04048	0.00715	I	0.26594	0.04038	0.00733
II	0.31334	0.61168	0.04957	II	0.32105	0.62192	0.05178
III	0.42216	0.34785	0.94328	III	0.41301	0.33769	0.94089
(4) Durable Manufacturing							
	I	II	III		I	II	III
I	0.18311	0.03797	0.00910	I	0.18509	0.03822	0.00931
II	0.19620	0.37065	0.02565	II	0.20223	0.38045	0.02675
III	0.62069	0.59138	0.96525	III	0.61268	0.58133	0.96394
(5) Finance, Insurance and Real Estates							
	I	II	III		I	II	III
I	0.84511	0.01662	0.00000	I	0.84307	0.01617	0.00000
II	0.12021	0.96874	0.00000	II	0.12336	0.96999	0.00000
III	0.03468	0.01465	1.00000	III	0.03358	0.01384	1.00000
(6) Service							
	I	II	III		I	II	III
I	0.70582	0.01385	0.00000	I	0.70721	0.01358	0.00000
II	0.11453	0.86960	0.00000	II	0.11787	0.87542	0.00000
III	0.17965	0.11655	1.00000	III	0.17492	0.11100	1.00000

TABLE 20

IMPACT ON TRADE COEFFICIENTS BEFORE AND AFTER
THE FIVE PERCENT CHANGE IN SERVICE PRICE OF CAPITAL

NO CHANGE IN SERVICE PRICE OF CAPITAL				5% INCREASE IN SERVICE PRICE OF CAPITAL, REGION 1			
(1) Agricultural, Forestry, and Fisheries							
	I	II	III		I	II	III
I	0.30609	0.05054	0.01570	I	0.30399	0.05007	0.01554
II	0.33679	0.51958	0.05821	II	0.33778	0.51979	0.05821
III	0.35712	0.42988	0.92610	III	0.35823	0.43014	0.92625
(2) Mining							
	I	II	III		I	II	III
I	0.17442	0.01248	0.00895	I	0.17239	0.01230	0.00882
II	0.61868	0.77205	0.19651	II	0.62040	0.77220	0.19653
III	0.10690	0.11546	0.69454	III	0.10721	0.11550	0.69465
(3) Non-Durable Manufacturing							
	I	II	III		I	II	III
I	0.26370	0.04013	0.00718	I	0.26191	0.03978	0.00712
II	0.31782	0.61697	0.05066	II	0.31856	0.61716	0.05065
III	0.41848	0.34290	0.94216	III	0.41952	0.34306	0.94223
(4) Durable Manufacturing							
	I	II	III		I	II	III
I	0.18272	0.03776	0.00912	I	0.18112	0.03737	0.00903
II	0.19952	0.37564	0.02619	II	0.19989	0.37576	0.02619
III	0.61776	0.58660	0.96469	III	0.61900	0.58687	0.96479
(5) Finance, Insurance and Real Estates							
	I	II	III		I	II	III
I	0.84225	0.01617	0.00000	I	0.84007	0.01591	0.00000
II	0.12322	0.96959	0.00000	II	0.12492	0.96984	0.00000
III	0.03453	0.01424	1.00000	III	0.03501	0.01424	1.00000
(6) Service							
	I	II	III		I	II	III
I	0.70383	0.01354	0.00000	I	0.70066	0.01334	0.00000
II	0.11726	0.87269	0.00000	II	0.11851	0.87286	0.00000
III	0.17891	0.11377	1.00000	III	0.18083	0.11380	1.00000

TABLE 21

IMPACT ON TRADE COEFFICIENTS AFTER
THE FIVE PERCENT CHANGE IN SERVICE PRICE OF CAPITAL

5% INCREASE IN SERVICE PRICE OF CAPITAL, REGION 2				5% INCREASE IN SERVICE PRICE OF CAPITAL, REGION 3			
(1) Agricultural, Forestry, and Fisheries							
	I	II	III		I	II	III
I	0.30691	0.05077	0.01567	I	0.30736	0.05079	0.01588
II	0.33415	0.51641	0.05751	II	0.33845	0.52254	0.05892
III	0.35894	0.43282	0.92682	III	0.35419	0.42668	0.92520
(2) Mining							
	I	II	III		I	II	III
I	0.17622	0.01264	0.00897	I	0.17468	0.01250	0.00906
II	0.61567	0.77028	0.19403	II	0.61994	0.77367	0.19900
III	0.10812	0.11708	0.69699	III	0.10538	0.11383	0.69194
(3) Non-Durable Manufacturing							
	I	II	III		I	II	III
I	0.26417	0.04033	0.00716	I	0.26501	0.04028	0.00727
II	0.31520	0.61389	0.05002	II	0.31971	0.61986	0.05131
III	0.42063	0.34578	0.94282	III	0.41529	0.33986	0.94142
(4) Durable Manufacturing							
	I	II	III		I	II	III
I	0.18295	0.03788	0.00911	I	0.18410	0.03803	0.00923
II	0.19758	0.37273	0.02587	II	0.20110	0.37845	0.02651
III	0.61947	0.58939	0.96501	III	0.61480	0.58353	0.96426
(5) Finance, Insurance and Real Estates							
	I	II	III		I	II	III
I	0.84392	0.01643	0.00000	I	0.84273	0.01617	0.00000
II	0.12146	0.96910	0.00000	II	0.12330	0.96982	0.00000
III	0.03462	0.01448	1.00000	III	0.03397	0.01400	1.00000
(6) Service							
	I	II	III		I	II	III
I	0.70500	0.01372	0.00000	I	0.70581	0.01356	0.00000
II	0.11566	0.87090	0.00000	II	0.11762	0.87429	0.00000
III	0.17934	0.11538	1.00000	III	0.17657	0.11215	1.00000

APPENDIX II

The Data Collected for Phase II Study

APPENDIX II: Data Collected for Phase V Study

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TABLE 1

Values Added by Industry, 1972-77
Oklahoma

Industry	(Million Dollars)					
	1972	1973	1974	1975	1976	1977*
Livestock products	408.76	664.52	453.05	412.96	424.00	355.42
Meat animals	366.46	598.87	388.33	353.35	364.16	301.10
Dairy products	28.03	38.38	40.84	35.19	36.67	33.06
Poultry and eggs	11.63	24.24	20.80	20.83	19.95	17.71
Misc. livestock	2.64	3.03	3.08	3.59	3.22	2.95
Crops	120.04	345.38	317.45	305.24	219.40	234.98
Food grains	57.64	216.12	208.04	206.84	133.18	142.88
Feed crops	21.68	39.39	42.38	33.76	28.31	26.57
Cotton	14.81	45.45	26.20	21.55	18.66	22.44
Oil crops	15.86	27.27	27.74	25.86	25.74	27.16
Vegetables	2.64	3.03	4.62	5.03	3.86	3.54
Greenhouse and nursery	3.70	5.05	5.39	5.03	5.15	4.72
Fruits and nuts	1.06	5.05	.77	3.59	1.29	4.13
Forest products	(1)	(1)	(1)	(1)	.64	.59
All other crops	2.12	3.03	2.31	1.44	1.29	1.77
Food and kindred products	239.6	284.9	335.4	346.6	357.7	390.6
Textile mill products	23.6	23.0	21.6	16.3	40.3	30.3
Apparel, other textile products	76.7	98.8	127.8	127.4	146.9	158.3
Lumber and wood products	70.6	73.1	45.3	39.3	48.1	85.5
Furniture and fixtures	22.1	28.3	23.8	19.0	27.5	34.8
Paper and allied products	45.6	55.8	86.9	71.6	81.7	79.1
Printing and publishing	131.0	155.0	157.6	183.1	191.0	218.7
Chemicals and allied products	(3)	(3)	(3)	(3)	(3)	174.6
Petroleum and coal products	104.1	118.8	205.5	391.2	225.6	438.4
Rubber, misc. plastics products	139.0	193.1	229.8	270.1	284.2	383.6
Leather and leather products	(3)	(3)	(3)	(3)	(3)	10.8
Stone, clay, glass products	179.0	184.5	159.5	199.3	261.7	208.1
Primary metal industries	(3)	(3)	172.2	86.8	93.6	125.0
Fabricated metal products	224.1	229.4	350.8	317.6	353.1	518.7
Machinery except electrical	476.4	534.9	581.6	736.2	671.4	780.3
Electric, except equipment	202.4	211.4	196.4	209.2	325.7	400.1
Transportation equipment	150.0	191.3	250.8	233.9	249.1	331.1
Instruments, related products	(3)	(3)	(3)	(3)	(3)	99.6
Misc., manufacturing industries	(3)	(3)	(3)	(3)	(3)	42.0
Construction	528.18	717.07	776.72	814.04	839.04	995.97
Transportation and public utilities	1,201.10	1,344.72	1,472.11	1,666.76	1,887.89	2,114.98
Railroad transportation	80.83	88.82	98.82	105.73	112.06	118.09
Trucking and warehousing	251.29	288.36	315.04	324.79	355.57	413.37
Water transportation	(2)	(2)	1.60	1.54	1.53	1.54
Other transportation	231.98	238.74	258.27	280.72	328.95	381.46
Communication	281.11	326.60	373.91	420.23	489.64	541.79
Electrical, gas, and sanitary services	355.88	402.20	424.48	533.74	600.14	658.73

*See footnotes at end of Table 2

TABLE 1 (continued)

Industry	(Million Dollars) 1972	1973	1974	1975	1976	1977
Wholesale trade	760.62	882.01	1,024.42	1,321.58	1,261.74	1,420.01
Retail trade	1,268.26	1,449.70	1,542.26	1,778.75	1,948.84	2,209.19
Finance, insurance, and real estate	1,608.37	1,743.90	1,900.35	2,111.95	2,315.70	2,616.07
Services	1,244.34	1,438.87	1,544.32	1,791.04	1,911.57	2,183.43
Mining	696.13	717.96	1,103.18	1,279.60	1,702.66	2,068.18
Coal mining	12.45	10.22	16.04	(3)	30.67	49.15
Oil and gas extraction	658.34	676.77	1,057.81	1,263.36	1,656.83	2,031.80
Metal mining	1.62	1.84	(2)	(3)	(4)	(4)
Nonmetalic mineral, except fuels	23.72	29.12	29.33	31.47	29.98	34.46
Gross gov't. product	1,901.84	2,020.65	2,200.23	2,424.37	2,695.95	2,926.75
Total	12,006.12	13,922.08	15,442.29	17,357.49	18,814.49	21,775.68

* The manufacturing statistics are based on the preliminary Reports of 1977 Census of Manufactures.

TABLE 2
Values Added by Industry, 1972-77
Arkansas

Industry	(Million Dollars)					
	1972	1973	1974	1975	1976	1977
Livestock products	317.63	525.74	480.78	545.86	442.68	548.62
Meat animals	98.27	142.27	87.87	132.65	98.37	159.39
Dairy products	20.29	25.56	33.89	32.87	28.11	33.30
Poultry and eggs	195.27	353.46	352.74	374.47	310.17	349.97
Misc. livestock	3.80	4.45	6.28	5.87	6.02	5.78
Crops	316.37	585.76	774.52	628.04	561.12	606.38
Food grains	69.11	177.84	230.98	194.87	165.62	195.20
Feed crops	8.24	10.00	15.06	17.61	13.05	16.17
Cotton	98.27	113.37	75.32	153.78	110.42	139.76
Oil crops	125.53	264.54	429.31	237.13	252.96	234.47
Vegetables	7.61	8.89	10.04	10.57	7.03	5.78
Greenhouse and Nursery	1.90	2.22	2.51	2.35	2.01	2.31
Fruits and nuts	3.17	4.45	5.02	5.87	4.02	4.62
Forest products	2.54	4.45	5.02	3.52	4.02	4.62
All other crops	(1)	1.11	1.26	(1)	(1)	1.16
Food and kindred products	363.3	360.7	427.0	540.0	560.2	
Textile mill products	63.8	74.5	72.7	56.5	73.9	
Apparel, other textile products	126.4	151.3	154.4	146.9	173.0	
Lumber and wood products	270.3	305.7	363.6	318.2	397.7	
Furniture and fixtures	132.2	155.4	142.1	112.9	161.4	
Paper and allied products	244.9	247.3	365.2	342.0	400.5	
Printing and publishing	118.0	132.2	168.6	145.2	178.1	
Chemical and allied products	131.9	134.9	246.7	341.6	372.7	
Petroleum and coal products	34.7	46.2	27.9	115.5	94.1	
Rubber, misc. plastics products	124.4	140.8	166.4	169.4	277.3	
Leather and leather products	82.6	82.0	80.4	85.3	94.8	
Stone, clay, glass products	94.8	91.9	104.7	105.8	124.6	
Primary metal industries	111.6	131.8	165.6	122.6	156.3	
Fabricated metal products	173.1	235.2	239.0	265.5	324.3	
Machinery except electrical	134.2	160.3	201.2	177.5	212.1	
Electric, electronic equipment	340.3	385.6	387.2	343.1	411.7	
Transportation equipment	93.6	118.1	110.4	90.2	120.1	
Instruments, related products	(3)	(3)	(3)	(3)	(3)	
Misc., manufacturing industries	(3)	(3)	(3)	(3)	(3)	
Construction	342.89	458.73	505.77	544.73	601.39	722.81
Transportation and public utilities	701.89	820.21	890.18	1,020.20	1,161.34	1,279.06
Railroad transportation	133.30	148.99	157.53	162.22	186.77	196.81
Trucking and warehousing	156.88	188.49	204.84	208.79	231.77	263.19
Water transportation	1.46	1.49	3.19	4.63	4.59	4.61
Other transportation	30.93	34.97	37.98	38.62	48.33	49.07
Communication	166.42	198.99	225.63	262.12	309.47	352.06
Electrical, gas, and sanitary services	212.90	247.28	261.00	343.82	380.41	413.32

TABLE 2 (continued)

Industry	(Million Dollars) 1972	1973	1974	1975	1976	1977
Wholesale trade	415.83	502.73	587.17	711.49	791.82	853.70
Retail trade	845.51	980.60	1,054.86	1,164.22	1,304.94	1,488.11
Finance, insurance, and real estate	970.86	1,006.58	1,088.96	1,193.90	1,373.65	1,573.73
Services	729.32	840.91	936.99	1,062.95	1,194.43	1,365.70
Mining	71.62	73.36	109.26	120.92	156.87	182.38
Coal mining	3.56	3.41	8.02	(3)	(3)	(3)
Oil and gas extraction	34.27	27.84	60.68	59.80	(3)	(3)
Metal mining	8.10	11.05	11.23	12.91	14.34	16.46
Nonmetalic mineral, except fuels	25.70	31.06	29.33	(3)	(3)	(3)
Gross gov't. product	860.04	946.17	1,076.99	1,250.91	1,385.35	1,506.84
Total	8,377.46	9,894.19	11,146.48	11,944.22	13,251.59	10,127.33(5)

Footnotes for Tables 1 and 2

(1) Less than 0.05 percent of agricultural products.

(2) Less than $500,000.

(3) Not shown to avoid disclosure of confidential information.

(4) Negative.

(5) Not include values added in manufacturing sector.

Sources: For agricultural sectors, U.S. Department of Agriculture, Economic Research Service, State Farm Income Statistics, Supplement to Statistical Bulletin No. 547, 557, 576, 609.

For manufacturing sectors, U.S. Department of Commerce, Social and Economic Statistics Administration, Bureau of the Census, Annual Survey of Manufactures, 1972-1976, 1972 Census of Manufactures, Arkansas, Oklahoma (Washington, D.C.: U.S. Government Printing Office).

For other sectors, U.S. Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, Survey of Current Business, 1975-1978, (Washington, D.C.: U.S. Government Printing Office).

TABLE 3

Employment and Wage Statistics by Industry, 1972-76
Oklahoma

Industry	1972 Number of Employees (A) Mid-Mar	1972 Taxable Payroll ($1000) (B) Jan-Mar	1972 Per Capita Taxable Payroll($) (B/A)	1973 Number of Employees (A) Wk-Mar.12	1973 Taxable Payroll ($1000) (B) Annual	1973 Per Capita Taxable Payroll($) (B/A)	1974 Number of Employees (A) Wk.-Mar 12	1974 Taxable Payroll ($1000) (B) Annual	1974 Per Capita Taxable Payroll($) (B/A)
Agricultural Services, Forestry, Fisheries	2,522	2,408	955	1,133	7,345	6,483	1,520	7,869	5,177
Agricultural Services and Hunting	2,499	2,399	960	1,750	(1)	(1)	1,750	(1)	(1)
Forestry	0	0	0	60	(1)	(1)	60	(1)	(1)
Mining	27,507	65,511	2,382	26,140	279,960	10,710	26,462	318,545	12,038
Metal Mining	(1)	(1)	(1)	253	2,174	8,593	224	1,470	6,563
Anthracite Mining	0	0	0	0	0	0	277	5,008	18,079
Bituminous coal and Lignite Mining	(1)	(1)	(1)	376	5,111	13,593	473	7,222	15,268
Oil and gas extraction	18,646	40,670	2,181	19,718	196,500	9,966	19,473	227,126	11,664
Nonmetallic minerals, except fuels	1,327	2,341	1,764	1,007	10,160	10,089	1,735	12,221	7,044
Administrative and auxiliary	6,764	20,621	3,049	4,786	66,015	13,793	4,280	65,498	15,303
Contract construction	43,779	75,917	1,734	50,930	433,095	8,504	50,565	456,240	9,023
General Building Contractors	12,520	21,700	1,733	14,464	111,338	7,698	13,760	120,018	8,722
Heavy Construction contractors	10,123	18,840	1,861	10,618	117,137	11,032	11,454	121,855	10,639
Special Trade Contractors	20,781	34,235	1,647	25,458	196,728	7,728	25,171	211,420	8,399
Administrative and Auxiliary	355	1,142	3,217	390	7,892	20,236	180	2,947	16,372
Manufacturing	133,496	263,654	1,975	153,962	1,388,369	9,018	163,334	1,515,784	9,280
Ordnance and Accessories	0	0	0	0	0	0	0	0	0
Food and Kindred Products	13,947	24,104	1,728	14,121	107,588	7,619	14,301	111,009	7,762
Textile Mill Products	2,335	3,454	1,479	1,696	10,667	6,290	1,874	10,175	5,430
Apparel and Other Textile Products	9,804	9,884	1,008	11,708	55,033	4,700	13,122	63,189	4,816
Lumber and Wood Products	3,141	5,164	1,644	4,283	30,529	7,128	3,999	27,041	6,762
Furniture and Fixture	1,901	2,695	1,418	1,675	14,269	8,519	2,618	16,953	6,476

See footnotes at the end of Table 5.

TABLE 3 (Continued)

Industry	1975 Number of Employees (A) Wk.-Mar 12	1975 Taxable Payroll ($1000) (B) Annual	1975 Per Capita Taxable Payroll($) (B/A)	1976 Number of Employees (A) Wk.-Mar 12	1976 Taxable Payroll ($1000) (B) Annual	1976 Per Capita Taxable Payroll($) (B/A)
Agricultural Services Forestry, Fisheries	1,838	12,236	6,657	2,470	17,907	7,250
Agricultural Services and Hunting	1,750	(1)	(1)	1,750	(1)	(1)
Forestry	175	(1)	(1)	60	(1)	(1)
Mining	29,405	414,686	14,103	32,705	491,827	15,038
Metal Mining	128	1,154	9,016	73	439	6,014
Anthracite Mining	0	0	0	0	0	0
Bituminous Coal and Lignite Mining	698	11,765	16,855	768	14,515	18,900
Oil and Gas extraction	21,546	284,076	13,185	24,885	342,141	13,749
Nonmetallic Minerals except fuels	1,165	11,193	9,608	1,334	14,545	10,903
Administrative and Auxiliary	5,868	106,497	18,149	5,645	120,187	21,291
Contract Construction	43,605	467,459	10,720	46,710	516,774	11,063
General Building Contractors	17,500	(1)	(1)	17,500	(1)	(1)
Heavy Construction Conractors	10,309	132,379	12,841	11,415	150,010	13,141
Special Trade Contractors	21,198	210,727	9,941	23,103	241,109	10,436
Administrative and Auxiliary	375	(1)	(1)	175	(1)	(1)
Manufacturing	155,341	1,639,904	10,557	159,351	1,839,287	11,542
Ordnance and Accessories	0	0	0	0	0	0
Food and Kindred Products	13,524	130,229	9,629	13,720	142,139	10,360
Textile Mill Products	1,563	11,650	7,454	2,053	20,745	10,105
Apparel and Other Textile Products	10,684	57,732	5,404	12,077	72,778	6,026
Lumber and Wood Products	3,180	24,518	7,710	3,212	27,711	8,627
Furniture and Fixture	1,768	14,772	8,355	2,438	19,721	8,089

TABLE 3 (Continued)

Industry	1972 Number of Employees (A) Mid-Mar	1972 Taxable Payroll ($1000) (B) Jan-Mar	1972 Per Capita Taxable Payroll($) (B/A)	1973 Number of Employees (A) Mid-Mar	1973 Taxable Payroll ($1000) (B) Jan-Mar	1973 Per Capita Taxable Payroll($) (B/A)	1974 Number of Employees (A) Wk.-Mar 12	1974 Taxable Payroll ($1000) (B) Annual	1974 Per Capita Taxable Payroll($) (B/A)
Paper and Allied Products	1,370	3,112	2,272	1,761	16,302	9,257	1,819	17,802	9,787
Printing and Publishings	8,022	13,582	1,693	9,299	67,993	7,312	9,343	73,969	7,917
Chemicals and Allied Products	1,411	3,069	2,175	1,650	51,486	31,204	1,959	25,286	12,908
Petroleum and Coal Products	4,927	13,160	2,671	5,124	58,335	11,385	5,270	65,264	12,384
Rubber and Plastic Products	5,972	12,194	2,042	7,163	66,918	9,342	7,860	79,111	10,065
Leather and Leather Products	586	572	976	750	(1)	(1)	750	(1)	(1)
Stone, Clay, and Glass Products	9,030	18,248	2,021	9,883	90,591	9,166	8,902	77,750	8,734
Primary Metal Industries	4,347	8,550	1,967	4,050	37,769	9,326	4,513	47,511	10,528
Fabricated Metal Products	13,370	25,299	1,892	14,667	130,785	8,917	16,160	148,478	9,188
Machinery, except electrical	17,676	38,457	2,176	26,583	237,770	8,944	28,135	288,288	10,247
Electrical Equipment and Supplies	10,247	20,843	2,034	12,935	107,012	8,273	14,142	112,736	7,972
Transportation Equipment	9,176	19,382	2,112	10,013	102,713	10,258	11,241	119,929	10,669
Instruments and Related Products	739	1,359	1,839	862	7,428	8,617	900	7,757	8,619
Misc. Manufacturing Industries	2,493	3,623	1,453	2,264	13,602	6,008	2,255	15,598	6,917
Administrative and Auxiliary	12,980	36,872	2,841	13,408	177,979	13,274	14,110	204,208	14,473
Transportation and Other Public Utilities	47,522	112,247	2,362	50,141	503,080	10,033	50,424	544,829	10,805
Local and Interurban Passenger Transit	1,446	2,049	1,417	1,584	9,582	6,049	1,658	10,529	6,350
Trucking and Warehousing	14,678	32,335	2,203	13,572	136,616	10,066	13,819	136,784	9,898
Water Transportation	146	159	1,089	308	1,565	5,081	123	679	5,520
Transportation by Air	6,609	20,412	3,089	2,779	24,796	8,923	2,830	24,617	8,699

TABLE 3 (Continued)

Industry	1975 Number of Employees (A) Wk.-Mar 12	1975 Taxable Payroll ($1000) (B) Annual	1975 Per Capita Taxable Payroll($) (B/A)	1976 Number of Employees (A) Wk.-Mar 12	1976 Taxable Payroll ($1000) (B) Annual	1976 Per Capita Taxable Payroll($) (B/A)
Paper and Allied Products	1,953	22,172	11,353	1,967	26,111	13,275
Printing and Publishings	9,587	83,779	8,739	9,565	92,191	9,638
Chemicals and Allied Products	1,836	20,407	11,115	1,746	23,475	13,445
Petroleum and Coal Products	4,376	68,549	15,665	4,787	74,215	15,503
Rubber and Plastic Products	8,519	89,871	10,549	8,545	96,396	11,281
Leather and Leather Products	750	(1)	(1)	750	(1)	(1)
Stone, Clay, and Glass Products	7,555	80,677	10,679	8,414	99,226	11,793
Primary Metal Industries	5,004	53,697	10,731	4,888	57,889	11,843
Fabricated Metal Products	17,013	180,938	10,635	17,193	206,216	11,994
Machinery, except electrical	28,376	310,514	10,943	28,144	342,449	12,168
Electrical Equipment and Supplies	11,003	104,230	9,473	10,143	112,804	11,121
Transportation Equipment	10,913	120,869	11,076	10,963	130,842	11,935
Instruments and Related Products	1,232	13,232	10,740	1,525	18,650	12,230
Misc. Manufacturing Industries	1,698	10,808	6,365	1,870	14,650	7,834
Administrative and Auxiliary	14,891	237,057	15,919	15,316	256,379	16,739
Transportation and Other Public Utilities	52,514	628,697	11,972	53,996	708,898	13,129
Local and Interurban Passenger Transit	1,750	(1)	(1)	1,750	(1)	(1)
Trucking and Warehousing	14,165	160,743	11,348	15,574	192,202	12,341
Water Transportation	130	850	6,538	113	947	8,381
Transportation by Air	3,123	29,249	9,366	2,712	32,572	12,010

TABLE 3 (Continued)

Industry	1972 Number of Employees (A) Mid-Mar	1972 Taxable Payroll ($1000) (B) Jan-Mar	1972 Per Capita Taxable Payroll($) (B/A)	1973 Number of Employees (A) Mid-Mar	1973 Taxable Payroll ($1000) (B) Jan-Mar	1973 Per Capita Taxable Payroll($) (B/A)	1974 Number of Employees (A) Wk.-Mar 12	1974 Taxable Payroll ($1000) (B) Annual	1974 Per Capita Taxable Payroll($) (B/A)
Pipe Line Transportation	1,759	5,321	3,025	2,256	21,600	9,574	2,195	32,394	14,758
Transportation Services	607	838	1,381	750	(1)	(1)	750	(1)	(1)
Communication	11,418	25,735	2,254	12,732	121,818	9,568	12,441	140,936	11,328
Electric, Gas and Sanitary Service	9,872	22,539	2,283	11,515	112,876	9,803	11,349	117,783	10,378
Administrative and Auxiliary	987	2,859	2,897	3,750	(1)	(1)	7,500	(1)	(1)
Wholesale Trade	47,181	93,896	1,990	51,338	455,395	8,871	53,902	523,901	9,720
Wholesale Trade - Durable Goods	(1)	(1)	(1)	26,951	259,406	9,625	28,869	293,891	10,180
Wholesale Trade - Non Durable Goods	(1)	(1)	(1)	20,744	153,997	7,424	21,659	185,459	8,563
Administrative & Auxiliary	1,437	4,505	3,135	3,643	41,992	11,527	3,374	44,551	13,204
Retail Trade	139,850	146,813	1,050	149,327	815,711	5,463	154,070	783,736	5,087
Building Materials & Farm Equipment	7,076	9,408	1,330	5,584	35,193	6,302	5,542	36,617	6,607
General Merchandise	24,994	25,971	1,039	21,096	97,719	4,632	22,495	104,311	4,637
Food Store	20,829	23,381	1,123	22,045	109,134	4,951	22,904	124,482	5,435
Automotive Dealers & Service Stations	23,703	33,471	1,412	25,112	164,397	6,547	22,598	165,215	7,311
Apparel and Accessory Stores	9,391	9,143	974	13,224	50,420	3,813	12,620	55,054	4,362
Furniture and Home Furnishing Stores	5,306	7,023	1,324	5,982	36,899	6,168	6,112	39,758	6,505
Eating and Drinking Places	31,829	18,176	571	36,166	143,727	3,974	39,995	108,417	2,711
Misc. Retail Stores	14,124	14,388	1,019	15,582	70,576	4,529	16,529	84,337	5,102
Administrative & Auxiliary	2,598	5,852	2,253	4,536	107,646	23,731	5,275	65,545	12,426
Finance, Insurance, and Real Estate	41,629	69,017	1,658	37,246	292,742	7,860	41,583	328,881	7,909
Banking	12,269	20,065	1,635	13,122	98,683	7,520	14,063	109,678	7,799
Credit Agencies Other Than Banks	4,747	8,536	1,798	4,527	34,886	7,706	5,329	43,367	8,138

TABLE 3 (Continued)

Industry	1975 Number of Employees (A) Wk.-Mar 12	1975 Taxable Payroll ($1000) (B) Annual	1975 Per Capita Taxable Payroll($) (B/A)	1976 Number of Employees (A) Wk.-Mar 12	1976 Taxable Payroll ($1000) (B) Annual	1976 Per Capita Taxable Payroll($) (B/A)
Pipe Line Transportation	2,376	38,300	16,120	2,074	36,135	17,423
Transportation Services	562	4,622	8,224	643	5,529	8,599
Communication	13,617	159,523	11,715	14,126	181,025	12,815
Electric, Gas and Sanitary Service	11,943	139,470	11,678	11,963	154,162	12,887
Administrative and Auxiliary	7,500	(1)	(1)	7,500	(1)	(1)
Wholesale Trade	55,225	599,807	10,861	56,435	648,476	11,491
Wholesale Trade - Durable Goods	27,728	310,459	11,197	28,771	344,778	11,984
Wholesale Trade - Non Durable Goods	23,506	230,283	9,797	23,113	234,598	10,150
Administrative & Auxiliary	3,991	59,065	14,800	4,551	69,100	15,183
Retail Trade	152,090	869,543	5,717	165,946	1,007,021	6,068
Building Materials & Farm Equipment	5,201	38,245	7,353	5,891	47,215	8,015
General Merchandise	21,302	109,233	5,128	21,900	119,057	5,436
Food Store	22,725	141,049	6,207	23,871	158,475	6,639
Automotive Dealers & Service Stations	22,760	177,627	7,804	24,034	201,146	8,369
Apparel and Accessory Stores	11,884	56,867	4,785	12,502	64,385	5,150
Furniture and Home Furnishing Stores	5,528	41,059	7,427	6,082	48,697	8,007
Eating and Drinking Places	39,950	131,009	3,279	46,830	160,438	3,426
Misc. Retail Stores	16,857	92,381	5,480	18,435	113,535	6,159
Administrative & Auxiliary	5,883	82,073	13,951	6,401	94,073	14,697
Finance, Insurance, and Real Estate	41,360	357,750	8,650	45,619	413,408	9,062
Banking	14,463	125,258	8,661	15,336	141,340	9,216
Credit Agencies Other Than Banks	4,982	42,179	8,466	5,467	50,311	9,203

TABLE 3 (Continued)

Industry	1972 Number of Employees (A) Mid-Mar	1972 Taxable Payroll ($1000) (B) Jan-Mar	1972 Per Capita Taxable Payroll($) (B/A)	1973 Number of Employees (A) Mid-Mar	1973 Taxable Payroll ($1000) (B) Jan-Mar	1973 Per Capita Taxable Payroll($) (B/A)	1974 Number of Employees (A) Wk.-Mar 12	1974 Taxable Payroll ($1000) (B) Annual	1974 Per Capita Taxable Payroll($) (B/A)
Security, Commodity Brokers & Services	938	3,048	3,249	807	12,271	15,206	892	12,906	14,469
Insurance Carriers	8,779	17,662	2,012	5,980	60,688	10,148	6,811	62,827	9,224
Insurance Agents, Brokers and Service	3,491	5,393	1,545	3,602	25,701	7,135	3,722	29,847	8,019
Real Estate	9,205	10,861	1,180	7,354	45,552	6,194	8,721	52,693	6,042
Combined Real Estate, Insurance, etc.	(1)	(1)	(1)	443	2,302	5,196	420	2,397	5,707
Holding and Other Investment Companies	1,361	2,377	1,747	1,352	11,671	8,632	1,500	13,176	8,784
Administrative and Auxiliary	0	0	0	59	988	16,746	125	1,990	15,920
Services	119,216	142,189	1,193	117,652	685,486	5,826	129,608	780,676	6,023
Hotels and Other Lodging Places	6,885	5,120	744	7,095	26,865	3,786	7,946	28,713	3,614
Personal Services	11,272	10,587	939	11,511	47,361	4,114	11,133	47,493	4,266
Misc. Business Services	13,332	17,467	1,310	17,447	91,396	5,238	16,229	94,728	5,837
Auto Repair, Services & Garages	4,975	7,200	1,447	4,698	33,567	7,145	4,730	35,790	7,567
Misc. Repair Services	4,141	6,318	1,526	2,991	21,378	7,147	2,966	21,531	7,259
Motion Pictures	1,875	1,287	686	1,539	4,959	3,222	1,502	4,831	3,216
Amusement and Recreation Services	3,926	3,722	948	3,967	17,708	4,464	4,390	19,739	4,496
Medical and Other Health Services	42,099	51,827	1,231	37,270	266,821	7,159	45,707	301,706	6,601
Legal Services	2,732	4,307	1,577	3,140	24,777	7,891	3,227	29,473	9,133
Educational Services	5,093	6,814	1,338	4,540	24,139	5,317	5,438	36,316	6,678
Social Services	0	0	0	5,744	18,417	3,206	6,571	28,596	4,352
Museums, Botanical, Zoological Gardens	(2)	(2)	(2)	380	1,839	4,839	67	198	2,955
Non Profit Membership Organization	15,818	13,797	872	10,646	44,125	4,145	12,093	57,809	4,780

TABLE 3 (Continued)

Industry	1975 Number of Employees (A) Wk.-Mar 12	1975 Taxable Payroll ($1000) (B) Annual	1975 Per Capita Taxable Payroll($) (B/A)	1976 Number of Employees (A) Wk.-Mar 12	1976 Taxable Payroll ($1000) (B) Annual	1976 Per Capita Taxable Payroll($) (B/A)
Security, Commodity Brokers & Services	805	13,671	16,983	847	15,517	18,320
Insurance Carriers	7,096	70,265	9,902	8,089	79,913	9,879
Insurance Agents, Brokers and Service	4,187	34,542	8,250	4,624	40,928	8,851
Real Estate	7,808	52,347	6,704	8,436	57,600	6,828
Combined Real Estate, Insurance, etc.	375	(1)	(1)	375	(1)	(1)
Holding and Other Investment Companies	1,556	15,577	10,011	1,768	18,051	10,210
Administrative and Auxiliary	60	(1)	(1)	750	(1)	(1)
Services	135,983	899,139	6,612	143,458	1,043,467	7,274
Hotels and Other Lodging Places	7,338	30,147	4,108	8,754	36,281	4,145
Personal Services	10,725	49,257	4,593	10,632	55,184	5,190
Misc. Business Services	15,665	104,059	6,643	19,206	132,839	6,917
Auto Repair, Services & Garages	4,839	39,667	8,197	5,254	44,745	8,516
Misc. Repair Services	2,961	24,709	8,345	3,119	27,526	8,825
Motion Pictures	1,463	4,865	3,325	1,750	(1)	(1)
Amusement and Recreation Services	4,336	20,454	4,717	4,638	23,856	5,144
Medical and Other Health Services	48,421	362,414	7,485	48,709	406,800	8,352
Legal Services	3,536	35,638	10,079	3,792	42,748	11,273
Educational Services	5,721	39,869	6,969	6,264	46,137	7,365
Social Services	10,805	36,308	3,360	8,849	40,386	4,564
Museums, Botanical, Zoological Gardens	60	(1)	(1)	175	(1)	(1)
Non Profit Membership Organization	12,230	62,406	5,103	13,335	71,143	5,335

TABLE 3 (Continued)

Industry	1972 Number of Employees (A) Mid-Mar	1972 Taxable Payroll ($1000) (B) Jan-Mar	1972 Per Capita Taxable Payroll($) (B/A)	1973 Number of Employees (A) Mid-Mar	1973 Taxable Payroll ($1000) (B) Jan-Mar	1973 Per Capita Taxable Payroll($) (B/A)	1974 Number of Employees (A) Wk.-Mar 12	1974 Taxable Payroll ($1000) (B) Annual	1974 Per Capita Taxable Payroll($) (B/A)
Misc. Services	6,729	13,281	1,974	5,350	52,110	9,740	6,342	64,297	10,138
Administrative and Auxiliary	(1)	(1)	(1)	1,334	10,030	7,519	1,267	9,456	7,463
Unclassified Establishments	7,519	7,720	1,027	12,595	121,967	9,684	9,755	91,083	9,337
TOTAL	610,221	979,372	1,605	650,464	4,983,156	7,661	681,223	5,351,544	7,856

TABLE 3 (Continued)

Industry	1975 Number of Employees (A) Wk.-Mar 12	1975 Taxable Payroll ($1000) (B) Annual	1975 Per Capita Taxable Payroll($) (B/A)	1976 Number of Employees (A) Wk.-Mar 12	1976 Taxable Payroll ($1000) (B) Annual	1976 Per Capita Taxable Payroll($) (B/A)
Misc. Services	6,627	77,132	11,639	7,693	98,393	12,790
Administrative and Auxiliary	1,750	(1)	(1)	1,468	11,755	8,007
Unclassified Establishments	9,291	65,306	7,029	1,962	16,964	8,646
TOTAL	676,652	5,954,526	8,800	708,652	6,704,028	9,460

TABLE 4

Employment and Wage Statistics by Industry, 1972-76
Arkansas

Industry	1972			1973			1974		
	Number of Employees (A) Mid-Mar	Taxable Payroll ($1000) (B) Jan-Mar	Per Capita Taxable Payroll($) (B/A)	Number of Employees (A) Mid-Mar	Taxable Payroll ($1000) (B) Jan-Mar	Per Capita Taxable Payroll($) (B/A)	Number of Employees (A) Wk.-Mar 12	Taxable Payroll ($1000) (B) Annual	Per Capita Taxable Payroll($) (B/A)
Agricultural Services, Forestry, Fisheries	3,286	3,203	975	3,431	3,760	1,096	3,418	24,601	7,197
Agricultural Services and Hunting	2,888	2,945	1,020	2,982	3,349	1,123	(1)	(1)	(1)
Forestry	(1)	(1)	(1)	382	363	950	1,479	14,077	9,518
Mining	3,760	7,352	1,955	3,703	7,432	2,007	4,053	42,586	10,507
Metal Mining	476	1,110	2,332	490	1,374	2,804	614	7,241	11,793
Bituminous Coal and Lignite Mining	137	349	2,547	107	309	2,888	170	1,855	10,912
Oil and Gas Extraction	1,623	3,141	1,935	1,572	2,906	1,849	1,788	18,426	10,305
Nonmetallic Minerals, except Fuels	1,510	2,712	1,796	1,521	2,791	1,835	1,419	14,253	10,044
Adminstrative and Auxiliary	0	0	0	0	0	0	62	811	13,081
Contract Construction	27,378	42,994	1,570	30,385	50,124	1,650	32,030	251,510	7,852
General Building Contractors	10,460	15,887	1,519	11,527	18,466	1,602	11,449	82,026	7,164
Heavy Construction Contractors	5,116	8,316	1,625	5,008	8,506	1,698	(1)	(1)	(1)
Special Trade Contractors	11,649	18,370	1,577	13,667	22,634	1,656	15,026	118,099	7,860
Administrative and Auxiliary	153	421	2,752	183	518	2,831	(1)	(1)	(1)
Manufacturing	173,806	266,762	1,535	189,058	307,951	1,629	200,879	1,475,302	7,344
Ordnance and Accessories	(1)	(1)	(1)	(1)	(1)	(1)	0	0	0
Food and Kindred Products	25,967	35,984	1,386	26,216	38,021	1,450	25,148	167,655	6,667
Textile Mill Products	4,149	6,096	1,469	4,594	7,213	1,570	4,665	33,479	7,177
Apparel and Other Textile Products	13,987	14,459	1,034	15,085	16,069	1,065	15,635	74,246	4,749
Lumber and Wood Products	20,463	27,802	1,359	20,767	30,828	1,484	21,537	145,204	6,742
Furniture and Fixture	12,946	16,771	1,295	13,724	19,218	1,400	12,967	80,060	6,174

See footnotes at the end of Table 5.

TABLE 4 (Continued)

Industry	1975 Number of Employees (A) Wk.-Mar 12	1975 Taxable Payroll ($1000) (B) Annual	1975 Per Capita Taxable Payroll($) (B/A)	1976 Number of Employees (A) Wk.-Mar 12	1976 Taxable Payroll ($1000) (B) Annual	1976 Per Capita Taxable Payroll($) (B/A)
Agricultural Services Forestry, Fisheries	3,538	26,516	7,495	3,967	32,804	8,269
Agricultural Services and Hunting	(1)	(1)	(1)	(1)	(1)	(1)
Forestry	1,869	15,880	8,497	1,634	16,963	10,381
Mining	4,238	52,527	12,394	5,064	68,144	13,457
Metal Mining	566	7,442	13,148	567	8,484	14,963
Bituminous Coal and Lignite Mining	140	2,104	15,029	283	5,638	19,922
Oil and Gas Extraction	2,149	26,939	12,536	2,435	34,017	13,970
Nonmetallic Minerals, except Fuels	1,303	14,139	10,851	1,685	17,975	10,668
Administrative and Auxiliary	80	1,903	23,787	94	2,030	21,596
Contract Construction	25,651	240,230	9,365	28,153	275,345	9,780
General Building Contractors	8,109	69,977	8,630	9,623	85,846	8,921
Heavy Construction Contractors	5,011	57,057	11,386	5,067	57,773	11,402
Special Trade Contractors	12,479	112,736	9,034	13,397	130,745	9,759
Administrative and Auxiliary	52	460	8,846	66	981	14,864
Manufacturing	171,650	1,442,791	8,405	187,627	1,702,455	9,074
Ordnance and Accessories	0	0	0	0	0	0
Food and Kindred Products	22,969	179,361	7,809	24,112	204,879	8,497
Textile Mill Products	4,126	31,959	7,746	4,193	36,453	8,694
Apparel and Other Textile Products	13,673	72,949	5,335	14,913	95,239	6,386
Lumber and Wood Products	16,984	131,201	7,725	17,946	148,012	8,248
Furniture and Fixture	8,772	66,011	7,525	10,723	83,524	7,789

TABLE 4 (Continued)

Industry	1972 Number of Employees (A) Mid-Mar	1972 Taxable Payroll ($1000) (B) Jan-Mar	1972 Per Capita Taxable Payroll($) (B/A)	1973 Number of Employees (A) Mid-Mar	1973 Taxable Payroll ($1000) (B) Jan-Mar	1973 Per Capita Taxable Payroll($) (B/A)	1974 Number of Employees (A) Wk.-Mar 12	1974 Taxable Payroll ($1000) (B) Annual	1974 Per Capita Taxable Payroll($) (B/A)
Paper and Allied Products	9,686	21,815	2,252	10,874	25,176	2,315	9,428	107,620	11,415
Printing and Publishing	6,567	10,598	1,614	6,662	11,417	1,714	7,087	50,630	7,144
Chemicals and Allied Products	5,187	12,374	2,386	6,001	13,917	2,319	5,039	60,814	12,069
Petroleum and Coal Products	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Rubber and Plastic Products	4,573	8,573	1,875	4,914	10,733	2,184	7,102	64,858	9,132
Leather and Leather Products	8,200	9,124	1,113	8,258	9,628	1,166	8,370	45,812	5,473
Stone, Clay, and Glass Products	4,340	7,958	1,834	4,712	8,641	1,834	5,023	42,776	8,516
Primary Metal Industries	5,411	10,845	2,004	6,635	14,149	2,132	7,487	70,035	9,354
Fabricated Metal Products	7,673	12,393	1,615	9,186	15,396	1,676	13,466	104,342	7,749
Machinery, except Electrical	6,555	10,887	1,661	8,219	14,550	1,770	10,285	82,498	8,021
Electrical Equipment and Supplies	17,254	27,776	1,610	20,450	35,850	1,753	22,117	161,989	7,324
Transportation Equipment	6,675	9,632	1,443	7,936	12,608	1,589	6,999	52,264	7,467
Instruments and Related Products	(1)	(1)	(1)	(1)	(1)	(1)	9,329	57,818	6,198
Misc. Manufacturing Industries	4,230	5,889	1,392	4,442	6,310	1,421	5,139	28,321	5,511
Administrative & Auxiliary	3,057	7,126	2,331	2,929	7,096	2,423	2,435	31,310	12,858
Transportation and Other Public Utilities	25,660	50,127	1,954	27,415	57,731	2,106	26,840	256,834	9,569
Local and Interurban Passenger Transit	1,041	1,438	1,381	1,087	1,565	1,440	1,055	6,741	6,390
Trucking and Warehousing	9,933	18,713	1,884	10,620	21,606	2,034	10,262	91,561	8,922
Water transportation	114	179	1,570	(1)	(1)	(1)	(1)	(1)	(1)
Transportation by Air	356	807	2,267	698	1,739	2,491	550	6,067	11,031

TABLE 4 (Continued)

Industry	1975 Number of Employees (A) Wk.-Mar 12	1975 Taxable Payroll ($1000) (B) Annual	1975 Per Capita Taxable Payroll($) (B/A)	1976 Number of Employees (A) Wk.-Mar 12	1976 Taxable Payroll ($1000) (B) Annual	1976 Per Capita Taxable Payroll($) (B/A)
Paper and Allied Products	10,452	123,747	11,840	11,641	145,378	12,488
Printing and Publishing	6,281	51,998	8,279	6,040	55,294	9,155
Chemicals and Allied Products	5,190	68,802	13,257	5,654	83,181	14,712
Petroleum and Coal Products	2,502	25,038	10,007	1,671	18,213	10,899
Rubber and Plastic Products	5,907	56,282	9,528	10,845	94,239	8,690
Leather and Leather Products	7,575	47,591	6,283	8,896	53,852	6,054
Stone, Clay, and Glass Products	4,983	43,738	8,777	5,413	51,072	9,435
Primary Metal Industries	5,539	56,253	10,156	5,987	73,356	12,253
Fabricated Metal Products	12,141	112,505	9,267	14,672	139,706	9,522
Machinery, except Electrical	9,767	83,743	8,574	9,352	96,826	10,354
Electrical Equipment and Supplies	15,512	133,879	8,631	17,851	164,663	9,224
Transportation Equipment	5,056	44,276	8,757	6,986	54,860	7,853
Instruments and Related Products	7,579	56,299	7,428	4,505	37,785	8,387
Misc. Manufacturing Industries	3,880	22,662	5,841	3,504	25,513	7,281
Administrative & Auxiliary	2,762	34,497	12,490	3,083	40,409	13,107
Transportation and Other Public Utilities	26,176	284,364	10,864	28,263	330,608	11,698
Local and Interurban Passenger Transit	981	6,315	6,437	1,077	8,110	7,530
Trucking and Warehousing	9,314	102,260	10,979	9,948	114,949	11,555
Water Transportation	149	1,287	8,638	186	1,450	7,796
Transportation by Air	681	6,695	9,831	746	8,826	11,831

TABLE 4 (Continued)

Industry	1972 Number of Employees (A) Mid-Mar	1972 Taxable Payroll ($1000) (B) Jan-Mar	1972 Per Capita Taxable Payroll($) (B/A)	1973 Number of Employees (A) Mid-Mar	1973 Taxable Payroll ($1000) (B) Jan-Mar	1973 Per Capita Taxable Payroll($) (B/A)	1974 Number of Employees (A) Wk.-Mar 12	1974 Taxable Payroll ($1000) (B) Annual	1974 Per Capita Taxable Payroll($) (B/A)
Transportation Services	231	243	1,052	219	292	1,333	340	2,443	7,185
Communication	6,727	13,712	2,038	7,382	15,912	2,156	8,489	83,656	9,855
Electric, Gas and Sanitary Service	7,161	14,619	2,041	7,161	15,838	2,212	5,975	64,438	10,785
Administrative & Auxiliary	0	0	0	133	560	4,211	0	0	0
Wholesale Trade	26,396	45,570	1,726	26,992	49,759	1,843	33,735	289,278	8,575
Wholesale Trade-Durable Goods	0	0	0	0	0	0	17,634	155,141	8,798
Wholesale Trade-Nondurable Goods	0	0	0	0	0	0	15,166	123,507	8,144
Administrative & Auxiliary	394	902	2,289	332	887	2,672	935	10,630	11,369
Retail Trade	89,244	95,204	1,067	98,074	110,990	1,132	99,512	507,750	5,102
Building Materials & Farm Equipment	7,252	9,956	1,373	7,682	11,497	1,497	5,267	33,089	6,282
General Merchandise	14,769	15,439	1,045	16,731	18,335	1,096	14,215	68,887	4,846
Food Store	12,344	12,970	1,051	13,250	15,165	1,145	14,697	79,416	5,404
Automotive Dealers and Service Stations	16,602	23,350	1,406	18,054	27,085	1,500	16,447	112,744	6,855
Apparel and Accessory Stores	6,417	5,479	854	6,438	5,956	925	8,474	33,879	3,998
Furniture and Home Furnishing Stores	3,522	4,311	1,224	4,120	5,367	1,303	4,920	30,799	6,260
Eating and Drinking Places	15,972	9,318	583	18,334	10,836	591	19,793	55,960	2,827
Misc. Retail Stores	11,416	12,081	1,058	12,364	14,126	1,143	13,064	65,336	5,001
Administrative & Auxiliary	950	2,300	2,421	1,101	2,623	2,382	2,635	27,641	10,490
Finance, Insurance, and Real Estate	23,974	38,464	1,617	25,758	43,399	1,685	24,708	193,545	7,833
Banking	7,431	11,405	1,535	8,160	13,001	1,593	9,014	68,010	7,545
Credit Agencies Other Than Banks	2,102	3,613	1,719	2,122	3,918	1,846	2,409	19,644	8,154
Security, Commodity Brokers and Services	547	1,972	3,605	534	2,085	3,904	509	8,629	16,953
Insurance Carriers	4,733	9,643	2,037	4,823	10,453	2,167	4,250	39,230	9,231

TABLE 4 (Continued)

Industry	1975 Number of Employees (A) Wk.-Mar 12	1975 Taxable Payroll ($1000) (B) Annual	1975 Per Capita Taxable Payroll($) (B/A)	1976 Number of Employees (A) Wk.-Mar 12	1976 Taxable Payroll ($1000) (B) Annual	1976 Per Capita Taxable Payroll($) (B/A)
Transportation Services	282	2,199	7,798	322	2,701	8,388
Communication	8,722	94,734	10,861	9,397	112,307	11,951
Electric, Gas and Sanitary Service	6,030	70,667	11,719	6,249	78,216	12,517
Administrative & Auxiliary	0	0	0	0	0	0
Wholesale Trade	33,140	312,513	9,430	34,898	352,729	10,107
Wholesale Trade-Durable Goods	16,714	165,342	9,892	17,125	182,709	10,669
Wholesale " -Nondurable Goods	15,547	136,230	8,762	16,712	157,183	9,405
Administrative & Auxiliary	879	10,942	12,448	1,061	12,837	12,099
Retail Trade	95,357	537,620	5,638	103,205	636,197	6,164
Building Materials & Farm Equipment	4,703	35,330	7,512	5,329	41,701	7,825
General Merchandise	13,364	65,432	4,896	13,466	76,362	5,671
Food Store	15,310	91,900	6,003	15,966	108,848	6,817
Automotive Dealers and Service Stations	15,483	115,549	7,463	16,374	130,586	7,975
Apparel and Accessory Stores	8,076	36,601	4,532	8,095	41,401	5,114
Furniture and Home Furnishing Stores	4,547	31,582	6,946	4,829	35,864	7,427
Eating and Drinking Places	18,541	61,317	3,307	21,619	74,479	3,445
Misc. Retail Stores	13,120	74,026	5,642	14,088	86,225	6,120
Administrative & Auxiliary	2,213	25,882	11,695	3,439	40,731	11,844
Finance, Insurance, and Real Estate	24,039	204,403	8,503	25,241	232,876	9,226
Banking	9,246	77,213	8,351	9,577	83,861	8,756
Credit Agencies Other Than Banks	2,434	21,356	8,774	2,544	24,806	9,751
Security, Commodity Brokers and Services	444	9,996	22,514	530	16,443	31,025
Insurance Carriers	4,291	40,597	9,461	4,833	46,492	9,620

TABLE 4 (Continued)

Industry	1972 Number of Employees (A) Mid-Mar	1972 Taxable Payroll ($1000) (B) Jan-Mar	1972 Per Capita Taxable Payroll($) (B/A)	1973 Number of Employees (A) Mid-Mar	1973 Taxable Payroll ($1000) (B) Jan-Mar	1973 Per Capita Taxable Payroll($) (B/A)	1974 Number of Employees (A) Wk.-Mar 12	1974 Taxable Payroll ($1000) (B) Annual	1974 Per Capita Taxable Payroll($) (B/A)
Insurance Agents, Brokers and Service	2,152	3,471	1,613	2,222	3,880	1,746	2,228	17,985	8,072
Real Estate	6,142	7,228	1,177	7,075	8,478	1,198	5,364	32,528	6,064
Combined Real Estate, Insurance, etc.	520	777	1,494	540	919	1,702	518	3,788	7,313
Holding and Other Investment Companies	167	355	2,126	(1)	(1)	(1)	(1)	(1)	(1)
Administrative & Auxiliary	0	0	0	0	0	0	0	0	0
Services	70,835	73,914	1,043	75,777	84,132	1,110	83,766	455,534	5,438
Hotels and Other Lodging Places	5,941	4,257	717	6,542	4,843	740	6,733	22,618	3,359
Personal Services	7,692	6,787	882	7,666	7,176	936	7,687	31,858	4,144
Misc. Business Services	6,289	8,096	1,287	7,033	8,366	1,190	7,992	51,107	6,395
Auto Repair, Services and Garages	2,863	3,769	1,316	2,963	4,265	1,439	3,187	21,146	6,635
Misc. Repair Services	1,463	1,745	1,193	1,486	2,051	1,380	1,613	9,999	6,199
Motion Pictures	1,013	604	596	981	644	656	1,107	2,826	2,553
Amusement and Recreation Services	2,771	2,628	948	2,986	2,926	980	3,608	15,986	4,431
Medical and Other Health Services	23,623	27,430	1,161	25,923	32,144	1,240	30,041	189,558	6,310
Legal Services	1,354	1,577	1,165	1,489	1,960	1,316	1,709	12,001	7,022
Educational Services	3,611	3,929	1,088	3,991	4,538	1,137	3,369	23,745	7,047
Social Services	0	0	0	0	0	0	6,383	21,623	3,388
Non-profit Membership Organization	11,106	8,015	722	11,280	9,044	802	6,876	27,124	3,945
Misc. Services	2,875	4,849	1,687	3,279	5,960	1,818	2,804	23,235	8,286
Administrative & Auxiliary	147	138	939	64	120	1,875	641	2,643	4,123
Unclassified Establishments	4,435	4,262	961	3,401	3,394	998	4,768	27,917	5,855
TOTAL	448,594	627,852	1,400	483,994	718,672	1,485	513,709	3,254,857	6,336

TABLE 4 (Continued)

Industry	1975 Number of Employees (A) Wk.-Mar 12	1975 Taxable Payroll ($1000) (B) Annual	1975 Per Capita Taxable Payroll($) (B/A)	1976 Number of Employees (A) Wk.-Mar 12	1976 Taxable Payroll ($1000) (B) Annual	1976 Per Capita Taxable Payroll($) (B/A)
Insurance Agents, Brokers and Service	2,312	20,676	8,943	2,611	24,215	9,274
Real Estate	4,367	27,546	6,308	4,097	28,080	6,854
Combined Real Estate, Insurance, etc.	499	4,029	8,074	519	4,838	9,322
Holding and Other Investment Companies	(1)	(1)	(1)	464	3,478	7,496
Administrative & Auxiliary	0	0	0	66	662	10,030
Services	84,938	512,863	6,038	90,712	592,463	6,531
Hotels and Other Lodging Places	6,698	25,153	3,755	6,993	27,984	4,002
Personal Services	7,103	33,274	4,684	7,006	35,544	5,073
Misc. Business Services	7,814	53,784	6,883	8,700	57,336	6,590
Auto Repair, Services and Garages	3,127	23,973	7,666	3,398	26,961	7,934
Misc. Repair Services	1,384	10,609	7,665	1,763	13,336	7,564
Motion Pictures	996	2,956	2,968	1,143	3,344	2,926
Amusement and Recreation Services	3,383	16,859	4,983	3,742	19,532	5,220
Medical and Other Health Services	31,770	226,052	7,115	33,874	268,979	7,941
Legal Services	1,755	14,581	8,308	1,919	16,512	8,604
Educational Services	3,151	21,361	6,779	3,362	24,082	7,163
Social Services	7,348	27,657	3,764	7,873	33,003	4,192
Non-profit Membership Organization	7,390	29,789	4,031	7,379	34,320	4,651
Misc. Services	2,676	24,407	9,121	3,194	29,236	9,153
Administrative & Auxiliary	324	2,309	7,127	343	2,146	6,257
Unclassified Establishments	4,834	32,558	6,735	1,217	9,959	8,183
TOTAL	473,561	3,646,385	7,700	508,347	4,233,578	8,328

TABLE 5

Employment and Wage Statistics by Industry, 1972-76
U.S.

Industry	1972			1973			1974		
	Number of Employees (A) Mid-Mar	Taxable Payroll ($1000) (B) Jan-Mar	Per Capita Taxable Payroll($) (B/A)	Number of Employees (A) Wk.-Mar.12	Taxable Payroll ($1000) (B) Annual	Per Capita Taxable Payroll($) (B/A)	Number of Employees (A) Wk.-Mar 12	Taxable Payroll ($1000) (B) Annual	Per Capita Taxable Payroll($) (B/A)
Agricultural Services, Forestry, Fisheries	204.2	257.9	1,262	175.0	1,343.6	7,677	195.3	1,460.6	7,478
Agricultural Services and Hunting	181.5	223.2	1,229	147.7	1,075.5	7,281	166.4	1,182.9	7.108
Forestry	6.5	8.4	1,292	11.7	79.3	6,777	13.2	102.1	7,734
Fisheries	16.2	26.3	1,623	15.6	179.8	11,525	15.7	175.6	11,184
Mining	597.3	1,484.9	2,486	637.7	7,712.2	12,093	679.5	8,715.1	12,825
Metal Mining	77.2	199.3	2,581	80.8	936.0	11,584	84.3	1,083.3	12,850
Anthracite Mining	4.8	8.9	1,854	4.5	43.0	9,555	3.7	39.4	10,648
Bituminous Coal and Lignite Mining	147.0	396.4	2,696	151.2	1,817.5	12,020	162.4	2,224.1	13,695
Oil and Gas Extraction	208.2	484.0	2,324	224.1	2,521.4	11,251	244.1	2,914.4	11,939
Nonmetallic Minerals, except Fuels	105.5	225.1	2,133	110.4	1,233.8	11,175	114.7	1,345.9	11,734
Administrative & Auxiliary	54.6	171.2	3,135	66.7	1,160.5	17,398	70.3	1,108.0	15,761
Contract Construction	3,398.2	7,837.7	2,306	3,941.0	43,842.6	11,124	3,970.4	45,830.3	11,543
General Contractors and Operative Builders	969.5	2,122.3	2,189	1,105.7	11,133.7	10,069	1,090.1	11,464.4	10,516
Heavy Construction Contractors	609.1	1,490.4	2,446	737.4	10,020.1	13,588	799.4	11,234.6	14,053
Special Trade Contractors	1,790.5	4,126.4	2,304	2,084.8	22,478.8	10,782	2,064.8	22,866.8	11,074
Administrative & Auxiliary	29.1	98.6	3,388	13.1	210.0	16,030	16.1	264.5	16,428
Manufacturing	18,696.2	41,146.9	2,200	20,089.7	202,131.9	10,061	20,325.6	214,086.1	10,532
Ordnance and Accessories	219.9	642.7	2,922	0.0	0.0	0	0.0	0.0	0
Food and Kindred Products	1,536.3	3,017.9	1,964	1,519.8	13,930.3	9,165	1,535.0	14,915.6	9,717
Tobacco Manufactures	63.9	118.6	1,856	70.8	580.3	8,196	69.5	626.1	9,008
Textile Mill Products	935.9	1,457.5	1,557	980.0	6,757.5	6,895	972.9	6,897.9	7,090
Apparel and Other Textile Products	1,349.0	1,747.6	1,295	1,411.8	8,128.4	5,757	1,375.9	8,212.7	5,969
Lumber and Wood Products	579.0	957.4	1,653	723.4	5,908.7	8,167	708.6	5,735.1	8,093
Furniture and Fixtures	468.3	770.7	1,645	490.8	3,659.0	7,455	493.6	3,800.8	7,700
Paper and Allied Products	631.6	1,436.6	2,274	646.1	6,634.0	10,267	647.3	7,014.1	10,835

TABLE 5 (Continued)

Industry	1975 Number of Employees (A) Wk.-Mar. 12	1975 Taxable Payroll ($1000) (B) Annual	1975 Per Capita Taxable Payroll($) (B/A)	1976 Number of Employees (A) Wk.-Mar. 12	1976 Taxable Payroll ($1000) (B) Annual	1976 Per Capita Taxable Payroll($) (B/A)
Agricultural Services, Forestry Fisheries	193.9	1,603.8	8,271	226.4	1,970.9	8,705
Agricultural Services and Hunting	163.6	1,296.6	7,925	193.9	1,607.5	8,290
Forestry	14.3	108.0	7,552	14.1	122.9	8,716
Fisheries	16.0	199.2	12,450	18.4	240.5	13,070
Mining	720.3	10,347.2	14,365	763.0	11,764.3	15,418
Metal Mining	88.6	1,209.6	13,652	87.5	1,345.4	15,376
Anthracite Mining	4.4	59.9	13,613	4.6	62.4	13,565
Bituminous Coal and Lignite Mining	189.0	3,021.8	15,988	211.3	3,441.8	16,288
Oil and Gas Extraction	263.3	3,481.0	13,220	279.5	4,056.1	14,511
Nonmentallic Minerals, except Fuels	100.8	1,243.1	12,332	101.1	1,337.0	13,224
Administrative & Auxiliary	74.2	1,331.8	17,948	79.1	1,521.6	19,236
Contract Construction	3,322.1	43,803.2	13,185	3,443.7	48,301.1	14,025
General Contractors and Operative Builders	875.3	10,466.6	11,957	920.7	11,652.9	12,656
Heavy Construction Contractors	718.7	11,638.9	16,194	729.6	12,728.1	17,445
Special Trade Contractors	1,713.6	21,438.8	12,510	1,777.3	23,629.4	13,295
Administrative & Auxiliary	14.5	258.9	17,855	16.1	290.7	18,055
Manufacturing	18,395.8	213,559.9	11,609	18,965.3	239,100.4	12,607
Ordnance and Accessories	0.0	0.0	0	0.0	0.0	0
Food and Kindred Products	1,454.6	15,831.0	10,882	1,480.5	17,383.6	11,741
Tobacco Manufactures	88.5	914.8	10,336	63.0	709.4	11,260
Textile Mill Products	812.6	6,517.2	8,020	884.5	7,563.1	8,550
Apparel and Other Textile Products	1,186.1	8,021.2	6,762	1,323.5	9,162.7	6,923
Lumber and Wood Products	567.7	5,341.6	9,409	632.5	6,480.8	10,246
Furniture and Fixtures	394.0	3,430.3	8,706	435.3	3,999.1	9,187
Paper and Allied Products	586.1	7,073.0	12,067	615.2	8,154.0	13,254

TABLE 5 (Continued)

Industry	1972 Number of Employees (A) Mid-Mar	1972 Taxable Payroll ($1000) (B) Jan-Mar	1972 Per Capita Taxable Payroll($) (B/A)	1973 Number of Employees (A) Wk.-Mar.12	1973 Taxable Payroll ($1000) (B) Annual	1973 Per Capita Taxable Payroll($) (B/A)	1974 Number of Employees (A) Wk.-Mar 12	1974 Taxable Payroll ($1000) (B) Annual	1974 Per Capita Taxable Payroll($) (B/A)
Printing and Publishing	1,056.3	2,296.4	2,174	1,116.3	10,942.1	9,802	1,116.0	11,441.3	10,252
Chemical and Allied Products	850.0	2,193.7	2,580	863.9	10,107.6	11,699	883.4	10,856.1	12,289
Petroleum and Coal Products	139.2	393.7	2,828	139.9	1,819.9	13,008	141.5	1,986.7	14,040
Rubber and Plastics Products, N.E.C.	555.5	1,109.6	1,997	684.0	6,115.9	8,941	695.4	6,440.4	9,261
Leather and Leather Products	277.4	398.8	1,437	275.5	1,697.5	6,161	264.6	1,649.4	6,233
Stone, Clay, and Glass Products	588.9	1,263.4	2,145	649.0	6,558.4	10,105	667.8	6,820.3	10,213
Primary Metal Industries	1,144.3	2,887.3	2,523	1,207.0	14,727.8	12,201	1,271.1	16,351.2	12,863
Fabricated Metal Products	1,312.6	2,900.9	2,210	1,578.3	15,940.7	10,099	1,590.6	16,876.1	10,609
Machinery, except Electrical	1,769.7	4,286.9	2,422	2,022.2	22,560.2	11,156	2,185.4	25,431.0	11,636
Electrical Equipment and Supplies	1,698.7	3,791.4	2,231	1,783.4	17,529.3	9,829	1,844.8	18,511.4	10,034
Transportation Equipment	1,700.7	4,524.8	2,660	1,834.7	22,674.3	12,358	1,711.4	22,705.0	13,266
Instruments and Related Products	383.6	924.4	2,409	494.4	5,164.3	10,445	529.5	5,672.2	10,712
Misc. Manufacturing Industries	412.0	698.4	1,695	471.3	3,660.6	7,767	466.5	3,767.3	8,075
Administrative & Auxiliary	1,023.4	3,327.2	3,251	1,127.1	17,035.1	15,114	1,154.8	18,375.4	15,912
Transportation and Other Public Utilities	3,895.4	9,381.9	2,408	3,937.6	44,786.6	11,374	4,046.4	47,602.4	11,764
Local and Interurban Passenger Transit	368.6	649.6	1,762	311.8	2,150.7	6,897	317.6	2,269.3	7,145
Trucking and Warehousing	1,066.0	2,497.1	2,342	1,102.7	12,871.2	11,672	1,121.1	12,711.0	11,338
Water Transportation	181.8	330.6	1,818	193.5	1,914.9	9,896	185.5	1,985.4	10,703
Transportation by Air	330.0	1,038.8	3,147	327.5	4,752.8	14,512	345.2	5,125.7	14,848

TABLE 5 (Continued)

Industry	1975 Number of Employees (A) Wk.-Mar. 12	1975 Taxable Payroll ($1000) (B) Annual	1975 Per Capita Taxable Payroll($) (B/A)	1976 Number of Employees (A) Wk.-Mar. 12	1976 Taxable Payroll ($1000) (B) Annual	1976 Per Capita Taxable Payroll($) (B/A)
Printing and Publishing	1,080.8	11,858.9	10,972	1,082.1	12,876.3	11,899
Chemical and Allied Products	835.5	11,227.9	13,438	856.5	12,469.1	14,558
Petroleum and Coal Products	145.3	2,266.8	15,600	143.8	2,501.4	17,394
Rubber and Plastics Products, N.E.C.	590.0	6,139.6	10,406	648.6	7,042.8	10,858
Leather and Leather Products	225.4	1,640.5	7,278	253.5	1,851.7	7,304
Stone, Clay, and Glass Products	575.2	6,442.4	11,200	580.5	7,192.3	12,389
Primary Metal Industries	1,155.4	15,317.1	13,256	1,102.0	17,074.2	15,493
Fabricated Metal Products	1,402.3	16,461.0	11,738	1,442.1	18,476.5	12,812
Machinery, except Electrical	2,076.2	25,252.7	12,162	1,990.8	27,267.7	13,696
Electrical Equipment and Supplies	1,577.6	17,851.3	11,315	1,610.2	19,792.6	12,292
Transportation Equipment	1,587.9	22,780.3	14,346	1,679.1	26,578.2	15,828
Instruments and Related Products	515.1	6,029.5	11,705	522.5	6,756.8	12,931
Misc. Manufacturing Industries	405.3	3,742.4	9,233	433.9	4,163.4	9,595
Administrative & Auxiliary	1,134.1	19,420.4	17,124	1,185.2	21,604.7	18,228
Transportation and Other Public Utilities	3,908.2	50,338.8	12,880	3,967.3	55,419.5	13,969
Local and Interurban Passenger Transit	306.9	2,484.3	8,094	303.9	2,669.4	8,783
Trucking and Warehousing	1,031.2	12,711.6	12,327	1,085.4	0.0	0
Water Transportation	184.2	2,155.7	11,703	186.1	2,425.9	13,035
Transportation by Air	338.7	5,458.9	16,117	340.0	5,984.1	17,600

TABLE 5 (Continued)

Industry	1972 Number of Employees (A) Mid-Mar	1972 Taxable Payroll ($1000) (B) Jan-Mar	1972 Per Capita Taxable Payroll($) (B/A)	1973 Number of Employees (A) Wk.-Mar 12	1973 Taxable Payroll ($1000) (B) Annual	1973 Per Capita Taxable Payroll($) (B/A)	1974 Number of Employees (A) Wk.-Mar 12	1974 Taxable Payroll ($1000) (B) Annual	1974 Per Capita Taxable Payroll($) (B/A)
Pipe Line Transportation	14.4	44.3	3,076	20.1	255.8	12,726	20.2	306.0	15,148
Transportation Services	110.5	211.6	1,914	120.3	1,259.5	10,469	132.9	1,276.4	9,604
Communication	1,123.1	2,698.1	2,402	1,161.4	12,974.1	11,171	1,177.6	14,306.1	12,148
Electric, Gas and Sanitary Service	654.0	1,773.2	2,711	603.3	7,230.5	11,984	644.4	8,176.9	12,689
Administrative & Auxiliary	47.3	138.6	2,930	97.0	1,377.1	14,196	101.9	1,445.6	14,186
Wholesale Trade	4,074.8	9,316.3	2,286	4,368.5	47,254.8	10,817	4,444.6	50,429.9	11,346
Wholesale Trade - Durable Goods	0.0	0.0	0	2,415.7	27,062.2	11,202	2,461.2	28,787.1	11,696
Wholesale Trade - Non-durable Goods	0.0	0.0	0	1,747.7	17,386.0	9,947	1,761.1	18,641.1	10,584
Administrative & Auxiliary	187.5	531.9	2,836	205.1	2,806.6	13,684	222.3	3,001.7	13,502
Retail Trade	11,647.8	14,094.0	1,210	12,422.6	71,616.0	5,764	12,402.6	71,791.0	5,788
Building Materials & Farm Equipment	489.2	766.8	1,567	431.1	3,202.9	7,429	440.9	3,366.2	7,634
General Merchandise	2,203.5	2,533.4	1,149	2,011.9	10,010.7	4,975	1,980.5	10,097.4	5,098
Food Stores	1,713.3	2,126.6	1,241	1,794.2	10,599.2	5,907	1,829.1	11,322.4	6,190
Automotive Dealers & Service Stations	1,729.9	2,731.6	1,579	1,817.0	13,569.9	7,468	1,617.3	13,135.8	8,122
Apparel and Accessory Stores	775.3	856.0	1,104	872.8	4,673.8	5,354	847.0	4,342.4	5,126
Furniture & Home Furnishing Stores	460.5	729.1	1,583	522.1	3,898.5	7,466	512.0	3,900.6	7,618
Eating and Drinking Places	2,642.5	1,986.0	751	2,931.2	10,424.0	3,556	3,096.9	10,965.8	3,540
Misc. Retail Stores	1,270.1	1,580.1	1,244	1,547.5	9,018.3	5,827	1,575.8	9,317.0	5,912
Administrative & Auxiliary	363.5	784.4	2,157	494.8	6,218.7	12,568	503.1	5,343.4	10,621
Finance, Insurance, and Real Estate	3,924.0	7,665.7	1,953	4,068.9	37,409.6	9,194	4,303.9	39,494.0	9,176

TABLE 5 (Continued)

Industry	1975 Number of Employees (A) Wk.-Mar. 12	1975 Taxable Payroll ($1000) (B) Annual	1975 Per Capita Taxable Payroll($) (B/A)	1976 Number of Employees (A) Wk.-Mar. 12	1976 Taxable Payroll ($1000) (B) Annual	1976 Per Capita Taxable Payroll($) (B/A)
Pipe Line Transportation	19.3	318.6	16,507	14.1	253.0	17,943
Transportation Services	135.7	1,356.3	9,994	144.1	1,559.3	10,820
Communication	1,135.7	15,125.5	13,318	1,133.2	16,464.4	14,529
Electric, Gas and Sanitary Service	648.6	8,998.7	13,874	657.4	10,030.3	15,257
Administrative and Auxiliary	107.9	1,729.2	16,025	103.1	1,717.1	16,654
Wholesale Trade	4,331.4	52,253.3	12,063	4,455.1	57,296.2	12,860
Wholesale Trade - Durable Goods	2,385.7	29,484.2	12,358	2,435.6	32,158.8	13,203
Wholesale Trade - Nondurable Goods	1,731.6	19,578.4	11,306	1,807.0	21,665.7	11,989
Administrative and Auxiliary	214.1	3,190.7	14,902	212.5	3,471.7	16,337
Retail Trade	12,270.6	76,152.1	6,206	12,972.2	84,944.2	6,548
Building Materials and Farm Equipment	412.8	3,427.9	8,304	441.8	3,931.6	8,899
General Merchandise	1,906.3	10,401.3	5,456	1,923.9	11,193.1	5,817
Food Stores	1,846.8	12,321.9	6,672	1,930.9	13,679.5	7,084
Automotive Dealers and Service Stations	1,628.2	13,781.1	8,464	1,727.3	15,551.4	9,003
Apparel and Accessory Stores	809.5	4,462.0	5,512	834.3	4,889.5	5,860
Furniture and Home Furnishing Stores	469.7	3,789.7	8,068	492.3	4,173.5	8,477
Eating and Drinking Places	3,126.6	12,235.9	3,913	3,447.1	14,032.3	4,070
Misc. Retail Stores	1,569.8	10,028.7	6,388	1,647.4	11,103.3	6,739
Administrative and Auxiliary	500.9	5,703.6	11,386	527.2	6,389.9	12,120
Finance, Insurance, and Real Estate	4,247.3	42,377.4	9,977	4,400.2	46,560.3	10,581

TABLE 5 (Continued)

Industry	1972 Number of Employees (A) Mid-Mar	1972 Taxable Payroll ($1000) (B) Jan-Mar	1972 Per Capita Taxable Payroll($) (B/A)	1973 Number of Employees (A) Wk.Mar 12	1973 Taxable Payroll ($1000) (B) Annual	1973 Per Capita Taxable Payroll($) (B/A)	1974 Number of Employees (A) Wk.-Mar 12	1974 Taxable Payroll ($1000) (B) Annual	1974 Per Capita Taxable Payroll($) (B/A)
Banking	1,080.7	2,021.6	1,870	1,106.7	9,478.3	8,564	1,194.4	10,261.3	8,591
Credit Agencies Other than Banks	380.3	693.9	1,824	413.6	3,844.3	9,294	444.0	3,956.9	8,911
Security, Commodity Brokers and Services	196.3	647.6	3,299	184.1	2,709.8	14,719	185.7	2,755.7	14,839
Insurance Carriers	1,025.0	2,243.6	2,188	1,029.2	10,351.3	10,057	1,074.7	10,766.6	10,018
Insurance Agents, Brokers and Services	291.7	564.0	1,933	335.6	3,195.9	9,522	346.5	3,367.6	9,718
Real Estate	814.8	1,213.7	1,489	819.8	5,930.0	7,233	849.3	6,216.2	7,319
Combined Real Estate, Insurance, etc.	36.7	62.7	1,708	31.3	239.5	7,651	30.2	246.8	8,172
Holding and Other Investment Companies	75.5	165.5	2,192	99.2	1,146.1	11,553	119.6	1,337.2	11,180
Administrative and Auxiliary	23.0	53.1	2,308	49.4	514.4	10,412	59.5	585.9	9,847
Services	11,102.1	16,270.1	1,465	11,941.0	83,408.0	6,985	12,420.5	91,092.3	7,334
Hotels and Other Lodging Places	828.5	796.1	960	811.9	3,657.2	4,504	826.2	3,859.6	4,671
Personal Services	917.1	996.0	1,086	963.3	4,510.0	4,681	920.3	4,510.0	4,900
Misc. Business Services	1,670.7	2,639.0	1,579	1,959.9	14,611.2	7,455	2,042.7	15,490.4	7,583
Auto Repair, Services and Garages	405.9	620.5	1,528	417.5	2,983.4	7,145	421.0	3,205.3	7,613
Misc. Repair Services	212.5	379.9	1,787	223.1	1,810.5	8,115	231.7	2,022.5	8,729
Motion Pictures	186.5	253.1	1,357	181.3	1,346.6	7,427	188.2	1,335.1	7,094
Amusement and Recreation Services, N.E.C.	467.7	556.6	1,190	499.0	3,101.3	6,215	512.4	3,354.6	6,546
Medical and Other Health Services	3,240.3	4,827.0	1,489	3,505.3	26,775.3	7,638	3,695.9	29,520.5	7,987
Legal Services	269.9	497.8	1,844	305.4	2,885.4	9,447	319.4	3,282.1	10,275

TABLE 5 (Continued)

Industry	1975 Number of Employees (A) Wk.-Mar. 12	1975 Taxable Payroll ($1000) (B) Annual	1975 Per Capita Taxable Payroll($) (B/A)	1976 Number of Employees (A) Wk.-Mar. 12	1976 Taxable Payroll ($1000) (B) Annual	1976 Per Capita Taxable Payroll($) (B/A)
Banking	1,210.6	11,453.7	9,461	1,244.8	12,369.4	9,936
Credit Agencies Other Than Banks	430.8	4,117.0	9,556	459.4	4,676.4	10,179
Security, Commodity Brokers and Services	165.4	3,099.1	18,737	173.5	3,546.0	20,438
Insurance Carriers	1,074.7	11,643.8	10,834	1,081.6	12,350.8	11,419
Insurance Agents, Brokers and Services	337.5	3,536.5	10,478	361.0	4,073.4	11,283
Real Estate	789.1	5,913.0	7,493	819.5	6,628.6	8,088
Combined Real Estate, Insurance, etc.	28.8	252.5	8,767	29.3	283.3	9,668
Holding and Other Investment Companies	145.0	1,656.9	11,426	153.9	1,765.2	11,469
Administrative and Auxiliary	65.4	704.9	10,778	77.2	867.2	11,233
Services	12,655.6	101,562.2	8,025	13,340.7	114,532.1	8,585
Hotels and Other Lodging Places	839.3	4,191.0	4,993	890.5	4,691.8	5,268
Personal Services	875.0	4,648.4	5,312	880.7	5,074.7	5,762
Misc. Business Services	1,956.4	16,299.0	8,331	2,126.7	18,671.3	8,779
Auto Repair, Services and Garages	410.0	3,461.8	8,443	444.2	3,967.8	8,932
Misc. Repair Services	227.5	2,145.0	9,428	242.8	2,455.8	10,114
Motion Pictures	181.2	1,408.4	7,772	184.6	1,549.1	8,391
Amusement and Recreation Services, N.E.C.	522.6	3,636.3	6,958	563.4	4,084.7	7,250
Medical and Other Health Services	3,917.3	34,764.3	8,874	4,089.1	39,567.2	9,676
Legal Services	338.1	3,814.6	11,282	363.1	4,435.5	12,215

TABLE 5 (Continued)

Industry	1972 Number of Employees (A) Mid-Mar	1972 Taxable Payroll ($1000) (B) Jan-Mar	1972 Per Capita Taxable Payroll($) (B/A)	1973 Number of Employees (A) Wk.-Mar 12	1973 Taxable Payroll ($1000) (B) Annual	1973 Per Capita Taxable Payroll($) (B/A)	1974 Number of Employees (A) Wk.-Mar 12	1974 Taxable Payroll ($1000) (B) Annual	1974 Per Capita Taxable Payroll($) (B/A)
Educational Services	959.9	1,588.5	1,654	900.7	6,546.9	7,268	924.3	7,395.9	8,001
Social Services	0.0	0.0	0	523.5	2,527.0	4,827	581.7	2,854.3	4,906
Museums, Botanical, Zoological Gardens	20.4	30.6	1,500	19.0	132.2	6,957	20.8	149.5	7,187
Non-profit Membership Organizations	1,248.1	1,459.3	1,169	964.6	4,999.0	5,182	1,006.3	5,441.3	5,407
Misc. Services	620.9	1,508.9	2,430	549.0	6,274.1	11,428	602.5	7,286.3	12,093
Administrative & Auxiliary	53.7	116.8	2,175	117.5	1,247.9	10,620	127.1	1,384.9	10,896
Unclassified Establish-ments	475.6	629.8	1,324	477.0	4,332.9	9,083	579.1	4,827.1	8,335
TOTAL	58,015.6	108,085.2	1,863	62,059.0	543,838.2	8,763	63,367.9	575,328.8	9,079

TABLE 5 (Continued)

Industry	1975 Number of Employees (A) Wk.-Mar 12	1975 Taxable Payroll ($1000) (B) Annual	1975 Per Capita Taxable Payroll($) (B/A)	1976 Number of Employees (A) Wk.-Mar.12	1976 Taxable Payroll ($1000) (B) Annual	1976 Per Capita Taxable Payroll($) (B/A)
Educational Services	958.0	8,134.2	8,490	983.4	8,666.8	8,813
Social Services	648.6	3,504.3	5,402	723.1	4,075.9	5,636
Museums, Botanical, Zoological Gardens	21.8	174.6	8,009	23.4	194.6	8,316
Non-profit Membership Organizations	1,028.6	6,013.0	5,845	1,071.1	6,618.5	6,179
Misc. Services	618.1	8,010.5	12,959	639.8	8,995.4	14,059
Administrative & Auxiliary	113.1	1,356.8	11,996	114.8	1,483.0	12,918
Unclassified Establishments	496.2	3,938.7	7,937	112.6	1,339.1	11,892
TOTAL	60,541.4	595,936.6	9,843	62,646.5	661,228.1	10,554

Footnotes for Tables 3-5

(1) Denotes figures withheld to avoid disclosure of operations of individual reporting units.

(2) Does not meet publication standards.

Sources: U.S. Department of Commerce, Social and Economic Statistics Administration, Bureau of the Census, County Business Patterns

Specific issues are as follows:

	TABLE 3	TABLE 4	TABLE 5
	County Business Patterns Oklahoma	County Business Patterns Arkansas	County Business Patterns U.S.
1973,	p. 11	p. 11	p. 13
1974,	pp. 1-2	--	pp. 1-2
1975,	pp. 1-2	pp. 1-2	pp. 1-2
1976,	pp. 1-2	pp. 1-2	pp. 1-2

TABLE 6

Values Added in Farm Sector, 1972-77

Oklahoma (Million Dollars)

		1972	1973	1974	1975	1976	1977
1.	Cash receipts from marketing	1,395.0	2,197.2	1,896.4	1,869.9	1,877.5	1,925.8
2.	Value of home consumption	17.5	21.8	24.6	27.7	29.1	32.4
3.	Gross rental value of dwellings	70.2	87.1	98.3	110.8	116.5	129.4
	Less:						
	Net rent to nonoperator landlords	78.8	133.0	125.1	117.9	113.7	113.2
4.	Net change in inventories	34.2	115.5	109.2	-29.0	-96.4	19.7
5.	Value of total farm output (1+2+3+4)	1,438.1	2,288.6	2,003.4	1,861.5	1,813.0	1,994.1
6.	Purchase of raw materials	600.7	934.7	821.4	674.8	651.3	848.8
	Feed	215.3	363.3	361.5	277.0	306.7	311.4
	Livestock	318.4	479.6	329.7	262.2	214.0	397.1
	Seed	18.5	27.4	32.9	35.2	36.6	41.2
	Fertilizer	48.5	64.4	97.3	100.4	94.0	99.1
7.	Repairs and operation of equipment	118.7	132.5	165.6	192.4	210.9	215.2
8.	Miscellaneous operating expense	189.9	211.5	245.9	276.1	307.4	339.7
9.	Total current expense (6+7+8)	909.3	1,278.7	1,232.9	1,143.3	1,169.6	1,403.7
10.	Gross farm product (5-9)	528.8	1,009.9	770.5	718.2	643.4	590.4

See footnotes at the end of Table 8.

TABLE 7

Values Added in Farm Sector, 1972-77

Arkansas (Million Dollars)

		1972	1973	1974	1975	1976	1977
1.	Cash receipts from marketing	1,362.2	2,088.3	2,149.3	2,137.4	2,370.4	2,468.8
2.	Value of home consumption	18.7	22.6	26.4	27.8	31.3	34.9
3.	Gross rental value of dwellings	74.9	90.4	105.5	111.0	125.2	139.6
	Less:						
	Net rent to nonoperator landlords	101.2	160.3	149.0	126.4	116.6	108.6
4.	Net change in inventories	38.0	49.7	269.0	99.5	-170.9	-56.7
5.	Value of total farm output (1+2+3+4)	1,392.6	2,090.7	2,401.2	2,249.2	2,239.4	2,478.0
6.	Purchase of raw materials	428.3	635.1	733.7	600.2	698.6	753.1
	Feed	284.5	459.2	509.4	392.6	466.7	487.1
	Livestock	71.9	74.9	78.5	66.0	85.5	107.9
	Seed	23.4	45.0	47.7	51.9	56.4	63.5
	Fertilizer	48.5	56.0	98.1	89.7	90.0	94.6
7.	Repairs and operation of equipment	116.9	126.8	164.5	191.2	212.3	220.1
8.	Miscellaneous operating expense	213.4	217.3	247.7	283.9	324.7	349.8
9.	Total current expense (6+7+8)	758.6	979.2	1,145.9	1,075.3	1,235.6	1,323.0
10.	Gross farm product (5-9)	634.0	1,111.5	1,255.3	1,173.9	1,003.8	1,155.0

See footnotes at the end of Table 8.

TABLE 8

Values Added in Farm Sector, 1972-77

U.S. (Million Dollars)

		1972	1973	1974	1975	1976	1977
1.	Cash receipts from marketing	61,190	87,068	92,449	88,209	94,501	96,084
2.	Value of home consumption	775	903	1,077	1,204	1,350	1,557
3.	Gross rental value of dwellings	3,530	4,114	4,905	5,485	6,150	7,093
	Less:						
	Net rent to nonoperator landlords	3,491	5,679	5,100	4,600	4,100	3,900
4.	Net change in inventories	861	3,406	-1,611	3,400	-2,365	412
5.	Value of total farm output (1+2+3+4)	62,865	89,812	91,720	93,698	95,536	101,246
6.	Purchase of raw materials	18,870	26,260	27,535	26,273	28,731	29,521
	Feed	8,397	13,224	14,513	12,647	14,291	13,840
	Livestock	6,668	8,065	5,131	4,950	5,871	6,736
	Seed	1,115	1,617	2,083	2,293	2,537	2,856
	Fertilizer	2,690	3,354	5,808	6,383	6,032	6,089
7.	Repairs and operation of equipment	4,708	5,229	6,659	7,806	8,775	9,510
8.	Miscellaneous operating expense	8,312	8,836	10,179	11,487	12,878	14,040
9.	Total current expense (6+7+8)	31,890	40,325	44,373	45,566	50,384	53,071
10.	Gross farm product (5-9)	30,975	49,487	47,347	48,132	45,152	48,175

Footnotes for Tables 6-8

1. Values of item 2 (Values of home consumption) and item 3 (Gross rental value of dwellings) are proportioned values of nonmoney income which includes the value of farm products consumed directly in farm households and the rental value of housing provided by farm dwellings. The proportions are based on the two item values shown on pages 13, 23, and 29 of Farm Income State Estimates 1959-72, FIS 222 Supplement/Aug. 1973, Economic Research Service, U.S. Dept. of Agriculture. The ratios between the two items are as follows:

Oklahoma (Table 1): 20%, 80%

Arkansas (Table 2): 20%, 80%

U.S. (Table 3): 18%, 82%

2. Sources of item 3 (Net rent to nonfarm landlord) and total current expense items (items 6, 7, and 8) for the years 1972-74 are as follows:

1972: U.S. Dept. of Agriculture, Economic Research Service, State Farm Income Statistics, Supplement to Statistical Bulletin No. 547, Sep. 1975, pp. 10, 26, and 34-36.

1973: U.S. Dept. of Agriculture, Economic Research Service, State Farm Income Statistics, Supplement to Statistical Bulletin No. 557, Aug. 1976, pp. 10, 26, and 34-36.

1974: U.S. Dept. of Agriculture, Economic Research Service, State Farm Income Statistics, Supplement to Statistical Bulletin No. 576, Sep. 1977, pp. 13, 29, and 37-39.

3. Source of all other items: U.S. Dept. of Agriculture, Economics, Statistics, and Cooperatives Service, State Farm Income Statistics, Supplement to Statistical Bulletin No. 609, Sep. 1978, pp. 17, 33, and 41-47.

TABLE 9

Values Added and Other Statistics in Manufacturing Sector, 1972-76

Oklahoma

Industry	1972				1973				1974			
	Man-Hours (Millions)	Wages (Million Dollars)	Value Added (Million Dollars)	Value of Shipment (Million Dollars)	Man-Hours (Millions)	Wages (Million Dollars)	Value Added (Million Dollars)	Value of Shipment (Million Dollars)	Man-Hours (Millions)	Wages (Million Dollars)	Value Added (Million Dollars)	Value of Shipment (Million Dollars)
Food and kindred products	18.8	60.2	239.6	925.6	17.8	63.5	284.9	1,180.4	18.8	69.4	335.4	1,359.9
Textile mill products	3.9	9.7	23.6	86.4	4.3	11.5	23.0	101.5	3.6	10.5	21.6	93.0
Apparel, other textile products	16.8	36.2	76.7	147.3	18.9	43.8	98.8	189.5	20.2	51.8	127.8	252.0
Lumber and wood products	6.9	21.4	70.6	160.5	6.6	22.1	73.1	153.8	5.8	20.2	45.3	131.2
Furniture and fixture	3.1	9.4	22.1	43.5	4.6	13.1	28.3	58.8	3.6	12.5	23.8	50.6
Paper and allied products	3.0	12.1	45.6	118.5	3.2	13.6	55.8	162.6	2.9	14.0	86.9	200.5
Printing and publishings	9.2	33.8	131.0	190.8	9.6	37.3	155.0	225.1	9.9	39.4	157.6	240.7
Chemicals and allied products	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Petroleum and coal products	7.9	38.8	104.1	880.5	7.9	41.5	118.8	1,004.3	7.9	44.2	205.5	1,788.2
Rubber, misc.,plastic products	10.3	43.5	139.0	270.9	11.4	51.8	193.1	348.0	12.6	60.2	229.8	441.9
Leather and leather products	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Stone, clay, glass products	14.7	54.8	179.0	278.0	14.3	57.8	184.5	296.6	11.8	49.8	159.5	267.9
Primary metal industries	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	7.8	34.5	172.2	284.5
Fabricated metal products	19.2	68.4	224.1	425.4	19.8	77.4	229.4	470.7	23.5	99.3	350.8	638.6
Machinery except electrical	29.7	110.8	476.4	869.9	34.5	138.6	534.9	1,026.0	34.5	150.4	581.6	1,119.7
Electric, electronic equipments	15.4	60.3	202.4	345.4	19.1	71.5	211.4	396.4	16.6	69.3	196.4	405.3
Transportation related products	13.3	51.3	150.0	271.9	14.5	59.3	191.3	321.7	14.3	68.7	250.8	383.8
Instruments related products	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Misc, manufacturing industries	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
TOTAL	186.1	659.0	2,268.5	5,346.3	200.1	754.4	2,597.3	6,336.1	201.3	821.5	3,108.2	7,945.2

See footnotes at the end of Table 10.

TABLE 9 (Continued)

Industry	1975 Man-Hours (Millions)	1975 Wages (Million Dollars)	1975 Value Added (Million Dollars)	1975 Value of Shipment (Million Dollars)	1976 Man-Hours (Millions)	1976 Wages (Million Dollars)	1976 Value Added (Million Dollars)	1976 Value of Shipment (Million Dollars)
Food and kindred products	18.0	76.9	346.6	1,438.9	17.6	81.1	357.7	1,464.2
Textile mill products	3.1	9.7	16.3	72.2	3.9	14.0	40.3	113.8
Apparel, other textile products	18.0	47.9	127.4	265.0	20.0	57.4	146.9	330.0
Lumber and wood products	4.9	18.4	39.3	126.1	5.0	18.9	48.1	139.0
Furniture and fixture	3.0	10.6	19.0	49.4	3.1	12.0	27.5	60.7
Paper and allied products	2.6	13.6	71.6	192.8	3.2	17.7	81.7	239.2
Printing and publishings	10.4	47.0	183.1	274.6	9.1	47.3	191.0	289.4
Chemicals and allied products	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Petroleum and coal products	7.3	46.8	391.2	2,247.3	8.0	54.7	225.6	2,605.3
Rubber, misc.,plastic products	12.1	63.5	270.1	497.6	11.9	66.6	284.2	532.7
Leather and leather products	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Stone, clay, glass products	11.1	51.8	199.3	334.5	12.4	65.7	261.7	443.5
Primary metal industries	7.4	34.9	86.8	178.2	7.4	37.7	93.6	214.2
Fabricated metal products	21.2	98.9	317.6	678.5	21.3	110.5	353.1	723.2
Machinery except electrical	35.2	168.0	736.2	1,344.2	34.4	178.5	671.4	1,396.1
Electric, electronic equipments	15.0	68.9	209.2	460.3	16.3	78.9	325.7	650.6
Transportation related products	12.4	73.3	233.9	372.3	14.0	80.6	249.1	461.1
Instruments related products	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Misc. manufacturing industries	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
TOTAL	188.6	856.3	3,451.2	8,904.0	194.8	953.1	3,607.7	10,126.0

TABLE 10

Values Added and Other Statistics in Manufacturing Sector, 1972-76

Arkansas

Industry	1972				1973				1974			
	Man-Hours (Millions)	Wages (Million Dollars)	Value Added (Million Dollars)	Value of Shipment (Million Dollars)	Man-Hours (Millions)	Wages (Million Dollars)	Value Added (Million Dollars)	Value of Shipment (Million Dollars)	Man-Hours (Millions)	Wages (Million Dollars)	Value Added (Million Dollars)	Value Shipment (Million Dollars)
Food and kindred products	41.6	99.6	363.3	1,608.0	42.2	107.1	360.7	2,086.0	39.9	113.7	427.0	2,506.0
Textile mill products	7.6	20.8	63.8	150.8	7.6	23.3	74.5	174.3	7.3	24.4	72.7	174.0
Apparel, other textile products	26.2	54.0	126.4	207.5	29.1	64.1	151.3	237.4	24.6	61.9	154.4	253.2
Lumber and wood products	40.7	106.8	270.3	602.0	38.9	108.4	305.7	669.1	38.1	127.0	363.6	737.0
Furniture and fixture	19.2	49.0	132.2	255.7	20.6	58.2	155.4	297.5	18.5	55.8	142.1	288.3
Paper and allied products	16.6	70.0	244.9	566.1	17.1	77.1	247.3	627.2	16.6	80.8	365.2	810.4
Printing and publishings	8.4	28.2	118.0	164.0	9.6	32.9	132.2	186.9	9.9	36.7	168.6	221.1
Chemicals and allied products	6.0	27.5	131.9	268.6	5.9	31.0	134.9	298.4	6.8	40.5	246.7	477.3
Petroleum and coal products	2.4	7.9	34.7	125.6	2.0	6.6	46.2	143.0	1.9	5.7	27.9	79.4
Rubber, misc.,plastic products	10.0	34.5	124.4	223.3	10.2	37.8	140.8	260.5	9.4	38.1	166.4	298.4
Leather and leather products	15.3	36.4	82.6	141.8	14.8	37.5	82.0	143.4	13.9	40.0	80.4	151.6
Stone, clay,glass products	7.5	25.4	94.8	158.1	7.4	26.4	91.9	167.5	8.1	29.3	104.7	170.1
Primary metal industries	9.6	37.4	111.6	339.7	11.6	46.0	131.8	431.9	10.7	49.8	165.6	496.5
Fabricated metal products	19.0	54.8	173.1	351.6	23.1	74.7	235.2	440.7	22.2	75.3	239.0	479.7
Machinery except electrical	11.2	34.7	134.2	238.0	13.1	43.4	160.3	294.9	14.9	53.9	201.2	378.1
Electric, electronic equipments	29.6	90.9	340.3	628.7	34.7	114.9	385.6	768.4	34.8	127.2	387.2	886.4
Transportation related products	9.5	29.6	93.6	205.7	11.5	37.1	118.1	261.7	10.1	35.9	110.4	290.1
Instruments related products	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Misc. manufacturing industries	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
TOTAL	298.3	854.0	2,805.5	6,519.9	319.3	982.0	3,153.4	7,835.7	306.7	1,060.2	3,641.0	9,071.3

TABLE 10 (Continued)

Industry	1975 Man-Hours (Millions)	1975 Wages (Million Dollars)	1975 Value Added (Million Dollars)	1975 Value of Shipment (Million Dollars)	1976 Man-Hours (Millions)	1976 Wages (Million Dollars)	1976 Value Added (Million Dollars)	1976 Value of Shipment (Million Dollars)
Food and kindred products	36.1	117.6	540.5	2,606.5	41.5	142.7	560.2	2,833.5
Textile mill products	6.7	23.4	56.5	161.1	6.8	26.5	73.3	205.9
Apparel, other textile products	22.4	61.1	146.9	245.0	26.8	71.7	173.0	275.1
Lumber and wood products	30.0	113.1	318.2	703.2	31.6	120.2	397.7	831.9
Funriture and fixture	14.5	46.9	112.9	238.3	17.7	61.3	161.4	314.2
Paper and allied products	14.5	81.8	342.0	824.2	17.0	100.5	400.5	984.0
Printing and publishings	7.9	34.6	145.2	218.1	8.7	39.0	178.1	242.1
Chemicals and allied products	7.5	46.1	341.6	602.8	8.9	57.0	372.7	701.3
Petroleum and coal products	3.6	16.2	115.5	393.8	3.1	16.3	94.1	397.2
Rubber, misc.,plastic products	9.2	39.7	169.4	324.9	13.5	64.4	277.3	447.1
Leather and leather products	13.7	40.2	85.3	156.1	13.7	44.8	94.8	176.8
Stone, clay, glass products	7.3	29.9	105.8	178.6	8.3	36.7	124.6	213.0
Primary metal industries	7.9	38.6	122.6	345.6	10.2	56.3	156.3	489.8
Fabricated metal products	21.9	80.6	265.5	548.7	24.1	96.8	324.3	641.8
Machinery except electrical	12.7	52.1	177.5	389.7	13.4	60.0	212.1	431.5
Electric, electronic equipments	25.9	102.2	343.1	768.1	29.4	127.9	411.7	888.3
Transportation related products	7.9	29.7	90.2	239.7	10.3	41.1	120.1	289.8
Instruments related products	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Misc. manufacturing industries	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
TOTAL	265.2	1,010.6	3,701.0	9,299.1	295.3	1,201.2	4,278.0	10,648.8

Footnotes for Tables 9-10

(1) Denotes figures withheld to avoid disclosure of operations of individual reporting units.

Sources: U.S. Department of Commerce, Social and Economic Statistics Administration, Bureau of the Census, 1972 Census of Manufactures, Oklahoma, p. Oklahoma 37-7 through p. Oklahoma 37-10, 1972 Census of Manufactures, Arkansas, p. Arkansas 4-7 through p. Arkansas 4-11, Annual Survey of Manufactures,
1973, pp. 176, 178-180
1974, pp. 192-193
1975, pp. 187, 189
1976, pp. 182, 184-186

TABLE 11
Values Added in Construction, Transportation, Service and Mining Sectors, 1972
Oklahoma

(Millions of dollars)

Industry	P.I. (1)	U.S. Ratios N.I./P.I. (2)	U.S. Ratios C.C.A./G.N.P. (3)	U.S. Ratios I.B.T/G.N.P. (4)	N.I. (5) [= (1)x(2)]	Value Added by Industry (6) [= (5)/1-(3)-(4)]
Construction	439.0000	1.1117	.0530	.0230	488.0363	528.1778
Transportation and public utilities	617.0000	1.3723	.1737	.1197	848.7513	1,201.1038
Railroad transportation	57.0000	1.1291	.1553	.0485	64.3587	80.8323
Trucking and warehousing	173.0000	1.1606	.1082	.0928	200.7838	251.2939
Water transportation	0.0000[2]	1.0816	.1576	.1030	0.0000	0.0000
Other transportation	150.0000	1.1435	.1576	.1030	171.5250	231.9786
Communication	125.0000	1.5070	.1905	.1394	188.3750	281.1148
Electrical, gas, and sanitary Services	112.0000	1.9974	.2178	.1536	223.7088	355.8842
Wholesale trade	439.0000	1.2196	.0522	.2439	535.4044	760.6257
Retail trade	834.0000	1.1571	.0581	.1810	965.0214	1,268.2631
Finance, insurance, and real estate	386.0000	2.7409	.1477	.1945	1,057.9874	1,608.3725
Services	1,051.0000	1.0774	.0595	.0305	1,132.3474	1,244.3378
Mining	386.0000	1.1998	.2487	.0846	464.1100	696.1302
Coal mining	7.0000	1.1860	.2487	.0846	8.3020	12.4524
Oil and gas extraction	365.0000	1.2025	.2487	.0846	438.9125	658.3358
Metal mining	1.0000	1.0795	.2487	.0846	1.0795	1.6192
Nonmetalic mineral, except fuels	12.0000	1.3180	.2487	.0846	15.8160	23.7228

See footnotes at the end of Table 28.

TABLE 12
Values Added in Construction, Transportation, Service and Mining Sectors, 1973
Oklahoma

(Millions of dollars)

Industry	P.I. (1)	U.S. Ratios: N.I./P.I. (2)	U.S. Ratios: C.C.A./G.N.P. (3)	U.S. Ratios: I.B.T/G.N.P. (4)	N.I. (5) [= (1)x(2)]	Value Added by Industry (6) [= (5)/1-(3)-(4)]
Construction	594.0000	1.1158	.0541	.0216	662.7852	717.0672
Transportation and public utilities	711.0000	1.3377	.1738	.1162	951.9342	1,344.7153
Railroad transportation	62.0000	1.1835	.1304	.0435	73.3770	88.8234
Trucking and warehousing	205.0000	1.1343	.1060	.0876	232.5315	288.3575
Water transportation	0.0000[2]	1.1227	.1436	.1050	0.0000	0.0000
Other transportation	157.0000	1.1426	.1436	.1050	179.3882	238.7386
Communication	151.0000	1.4485	.1988	.1315	218.7235	326.5992
Electrical, gas, and sanitary Services	135.0000	1.8364	.2295	.1541	247.9140	402.1966
Wholesale trade	493.0000	1.2994	.0475	.2262	640.6042	882.0105
Retail trade	992.0000	1.1035	.0551	.1898	1,094.6720	1,449.7047
Finance, insurance, and real estate	421.0000	2.6871	.1529	.1984	1,131.2691	1,743.9018
Services	1,220.0000	1.0729	.0611	.0292	1,308.9380	1,438.8678
Mining	411.0000	1.2380	.2243	.0794	499.9131	717.9565
Coal mining	6.0000	1.1865	.2243	.0794	7.1190	10.2240
Oil and gas extraction	389.0000	1.2114	.2243	.0794	471.2346	676.7695
Metal mining	1.0000	1.2825	.2243	.0794	1.2825	1.8419
Nonmetalic mineral, except fuels	15.0000	1.3518	.2243	.0794	20.2770	29.1211

See footnotes at the end of Table 28.

TABLE 13
Values Added in Construction, Transportation, Service and Mining Sectors, 1974
Oklahoma

(Millions of dollars)

Industry	P.I. (1)	U.S. Ratios: N.I./P.I. (2)	U.S. Ratios: C.C.A./G.N.P. (3)	U.S. Ratios: I.B.T/G.N.P. (4)	N.I. (5) [= (1)x(2)]	Value Added by Industry (6) [= (5)/1-(3)-(4)]
Construction	645.0000	1.1080	.0577	.0222	714.6600	776.7199
Transportation and public utilities	785.0000	1.3096	.1823	.1169	1,026.8010	1,472.1136
Railroad transportation	69.0000	1.1696	.1333	.0500	80.7024	98.8152
Trucking and warehousing	223.0000	1.1289	.1154	.0855	251.7447	315.0353
Water transportation	1.0000	1.2075	.1492	.0945	1.2075	1.5966
Other transportation	170.0000	1.1490	.1492	.0945	195.3300	258.2705
Communication	174.0000	1.4346	.2028	.1296	249.6204	373.9071
Electrical, gas, and sanitary Services	148.0000	1.6770	.2492	.1661	248.1960	424.4844
Wholesale trade	574.0000	1.3280	.0479	.2080	762.2720	1,024.4214
Retail trade	1,079.0000	1.0580	.0565	.2033	1,141.5820	1,542.2615
Finance, insurance, and real estate	445.0000	2.7980	.1536	.1912	1,245.1100	1,900.3510
Services	1,307.0000	1.0724	.0610	.0314	1,401.6268	1,544.3222
Mining	671.0000	1.3364	.1599	.0784	840.2915	1,103.1791
Coal mining	8.0000	1.5268	.1599	.0784	12.2144	16.0357
Oil and gas extraction	645.0000	1.2492	.1599	.0784	805.7340	1,057.8102
Metal mining	0.0000[2]	1.2220	.1599	.0784	0.0000	0.0000
Nonmetalic mineral, except fuels	17.0000	1.3143	.1599	.0784	22.3431	29.3332

See footnotes at the end of Table 28.

TABLE 14
Values Added in Construction, Transportation, Service and Mining Sectors, 1975
Oklahoma

(Millions of dollars)

Industry	P.I. (1)	U.S. Ratios N.I./P.I. (2)	U.S. Ratios C.C.A./G.N.P. (3)	U.S. Ratios I.B.T/G.N.P. (4)	N.I. (5) [= (1)x(2)]	Value Added by Industry (6) [= (5)/1-(3)-(4)]
Construction	665.0000	1.1175	.0635	.0236	743.1375	814.0404
Transportation and public utilities	851.0000	1.3652	.1811	.1170	1,168.0205	1,666.7596
Railroad transportation	73.0000	1.1690	.1403	.0526	85.3370	105.7329
Trucking and warehousing	224.0000	1.1388	.1202	.0944	255.0912	324.7914
Water transportation	1.0000	1.1643	.1490	.0962	1.1643	1.5425
Other transportation	189.0000	1.1211	.1490	.0962	211.8879	280.7206
Communication	202.0000	1.4009	.2035	.1231	282.9818	420.2284
Electrical, gas, and sanitary Services	163.0000	2.0341	.2242	.1546	331.5583	533.7384
Wholesale trade	769.0000	1.2616	.0477	.2182	970.1704	1,321.5780
Retail trade	1,152.0000	1.1636	.0530	.1934	1,340.4672	1,778.7516
Finance, insurance, and real estate	490.0000	2.8270	.1513	.1928	1,385.2300	2,111.9530
Services	1,503.0000	1.0813	.0603	.0323	1,625.1939	1,791.0446
Mining	709.0000	1.3489	.1771	.0755	956.3701	1,279.5961
Coal mining	0.0000[3]	1.3974	.1771	.0755	0.0000	0.0000
Oil and gas extraction	676.0000	1.3968	.1771	.0755	944.2368	1,263.3621
Metal mining	0.0000[3]	1.0721	.1771	.0755	0.0000	0.0000
Nonmetalic mineral, except fuels	18.0000	1.3067	.1771	.0755	23.5206	31.4699

See footnotes at the end of Table 28.

TABLE 15

Values Added in Construction, Transportation, Service and Mining Sectors, 1976
Oklahoma

(Millions of dollars)

Industry	P.I. (1)	U.S. Ratios N.I./P.I. (2)	U.S. Ratios C.C.A./G.N.P. (3)	U.S. Ratios I.B.T/G.N.P. (4)	N.I. (5) [= (1)x(2)]	Value Added by Industry (6) [= (5)/1-(3)-(4)]
Construction	692.000	1.1093	.0594	.0257	767.6356	839.0377
Transportation and public utilities	948.0000	1.4046	.1717	.1151	1,341.1985	1,887.8887
Railroad transportation	75.0000	1.2358	.1203	.0526	92.6850	112.0602
Trucking and warehousing	247.0000	1.1528	.1034	.0958	284.7416	355.5714
Water transportation	1.0000	1.1726	.1333	.1000	1.1726	1.5294
Other transportation	211.0000	1.1953	.1333	.1000	252.2083	328.9530
Communication	231.0000	1.4492	.1991	.1172	334.7652	489.6376
Electrical, gas, and sanitary Services	183.0000	2.0526	.2194	.1547	375.6258	600.1371
Wholesale trade	733.0000	1.2855	.0540	.1992	942.2715	1,261.7454
Retail trade	1,250.0000	1.1718	.0527	.1957	1,464.7500	1,948.8425
Finance, insurance, and real estate	558.0000	2.7556	.1438	.1922	1,537.6248	2,315.7000
Services	1,594.0000	1.0907	.0573	.0332	1,738.5758	1,911.5732
Mining	966.0000	1.2918	.1891	.0780	1,247.8788	1,702.6590
Coal mining	17.0000	1.3221	.1891	.0780	22.4757	30.6668
Oil and gas extraction	934.0000	1.3001	.1891	.0780	1,214.2934	1,656.8337
Metal mining	0.0000[4]	1.1678	.1891	.0780	0.0000	0.0000
Nonmetalic mineral, except fuels	17.0000	1.2927	.1891	.0780	21.9759	29.9848

See footnotes at the end of Table 28.

TABLE 16
Values Added in Construction, Transportation, Service and Mining Sectors, 1977
Oklahoma

(Millions of dollars)

Industry	P.I. (1)	U.S. Ratios N.I./P.I. (2)	U.S. Ratios C.C.A./G.N.P. (3)	U.S. Ratios I.B.T/G.N.P. (4)	N.I. (5) [= (1)x(2)]	Value Added by Industry (6) [= (5)/1-(3)-(4)]
Construction	824.0000	1.1108	.0560	.0250	915.2992	995.9730
Transportation and public utilities	1,073.0000	1.4042	.1683	.1138	1,517.5215	2,114.9848
Railroad transportation	81.0000	1.2150	.1159	.0507	98.4150	118.0886
Trucking and warehousing	289.0000	1.1686	.0915	.0915	337.7254	413.3726
Water transportation	1.0000	1.1999	.1241	.0949	1.1999	1.5364
Other transportation	241.0000	1.2362	.1241	.0949	297.9242	381.4650
Communication	257.0000	1.4426	.2044	.1113	370.7482	541.7919
Electrical, gas, and sanitary Services	204.0000	2.0172	.2175	.1578	411.5088	658.7303
Wholesale trade	835.0000	1.2610	.0576	.2009	1,052.9350	1,420.0067
Retail trade	1,394.0000	1.1916	.0513	.1968	1,661.0904	2,209.1906
Finance, insurance, and real estate	640.0000	2.7481	.1384	.1893	1,758.7840	2,616.0702
Services	1,805.0000	1.1026	.0547	.0338	1,990.1930	2,183.4262
Mining	1,168.0000	1.2827	.2012	.0744	1,498.1936	2,068.1855
Coal mining	28.0000	1.2715	.2012	.0744	35.6020	49.1469
Oil and gas extraction	1,122.0000	1.3118	.2012	.0744	1,471.8396	2,031.8051
Metal mining	0.0000 [4]	1.1927	.2012	.0744	0.0000	0.0000
Nonmetalic mineral, except fuels	20.0000	1.2480	.2012	.0744	24.9600	34.4561

See footnotes at the end of Table 28.

TABLE 17
Values Added in Construction, Transportation, Service and Mining Sectors, 1972
Arkansas

(Millions of dollars)

Industry	P.I. (1)	U.S. Ratios N.I./P.I. (2)	U.S. Ratios C.C.A./G.N.P. (3)	U.S. Ratios I.B.T/G.N.P. (4)	N.I. (5) [= (1)x(2)]	Value Added by Industry (6) [= (5)/1-(3)-(4)]
Construction	285.0000	1.1117	.0530	.0230	316.8345	342.8945
Transportation and public utilities	364.0000	1.3723	.1737	.1197	500.7756	701.8877
Railroad transportation	94.0000	1.1291	.1553	.0485	106.1354	133.3024
Trucking and warehousing	108.0000	1.1606	.1082	.0928	125.3448	156.8771
Water transportation	1.0000	1.0816	.1576	.1030	1.0816	1.4628
Other transportation	20.0000	1.1435	.1576	.1030	22.8700	30.9305
.. Communication	74.0000	1.5070	.1905	.1394	111.5180	166.4199
Electrical, gas, and sanitary Services	67.0000	1.9974	.2178	.1536	133.8258	212.8950
Wholesale trade	240.0000	1.2196	.0522	.2439	292.7040	415.8318
Retail trade	556.0000	1.1571	.0581	.1810	643.3476	845.5087
Finance, insurance, and real estate	233.0000	2.7409	.1477	.1945	638.6297	970.8570
Services	616.0000	1.0774	.0595	.0305	663.6784	729.3169
Mining	39.0000	1.1998	.2487	.0846	47.7510	71.6228
Coal mining	2.0000	1.1860	.2487	.0846	2.3720	3.5578
Oil and gas extraction	19.0000	1.2025	.2487	.0846	22.8475	34.2695
Metal mining	5.0000	1.0795	.2487	.0846	5.3975	8.0958
Nonmetalic mineral, except fuels	13.0000	1.3180	.2487	.0846	17.1340	25.6997

See footnotes at the end of Table 28.

TABLE 18
Values Added in Construction, Transportation, Service and Mining Sectors, 1973
Arkansas

(Millions of dollars)

Industry	P.I. (1)	U.S. Ratios N.I./P.I. (2)	U.S. Ratios C.C.A./G.N.P. (3)	U.S. Ratios I.B.T/G.N.P. (4)	N.I. (5) [= (1)x(2)]	Value Added by Industry (6) [= (5)/1-(3)-(4)]
Construction	380.0000	1.1158	.0541	.0216	424.0040	458.7298
Transportation and public utilities	436.0000	1.3377	.1738	.1162	588.9219	820.2140
Railroad transportation	104.0000	1.1835	.1304	.0435	123.0840	148.9941
Trucking and warehousing	134.0000	1.1343	.1060	.0876	151.9962	188.4874
Water transportation	1.0000	1.1227	.1436	.1050	1.1227	1.4941
Other transportation	23.0000	1.1426	.1436	.1050	26.2798	34.9744
Communication	92.0000	1.4485	.1988	.1315	133.2620	198.9876
Electrical, gas, and sanitary Services	83.0000	1.8364	.2295	.1541	152.4212	247.2764
Wholesale trade	281.0000	1.2994	.0475	.2262	365.1314	502.7281
Retail trade	671.0000	1.1035	.0551	.1898	740.4485	980.5966
Finance, insurance, and real estate	243.0000	2.6871	.1529	.1984	652.9653	1,006.5751
Services	713.0000	1.0729	.0611	.0292	764.9777	840.9121
Mining	40.0000	1.2380	.2243	.0794	51.0792	73.3581
Coal mining	2.0000	1.1865	.2243	.0794	2.3730	3.4080
Oil and gas extraction	16.0000	1.2114	.2243	.0794	19.3824	27.8363
Metal mining	6.0000	1.2825	.2243	.0794	7.6950	11.0513
Nonmetalic mineral, except fuels	16.0000	1.3518	.2243	.0794	21.6288	31.0625

See footnotes at the end of Table 28.

TABLE 19
Values Added in Construction, Transportation, Service and Mining Sectors, 1974
Arkansas

(Millions of dollars)

Industry	P.I. (1)	U.S. Ratios N.I./P.I. (2)	U.S. Ratios C.C.A./G.N.P. (3)	U.S. Ratios I.B.T/G.N.P. (4)	N.I. (5) [= (1)x(2)]	Value Added by Industry (6) [= (5)/1-(3)-(4)]
Construction	420.0000	1.1080	.0577	.0222	465.3600	505.7711
Transportation and public utilities	478.0000	1.3096	.1823	.1169	626.7265	890.1834
Railroad transportation	110.0000	1.1696	.1333	.0500	128.6560	157.5315
Trucking and warehousing	145.0000	1.1289	.1154	.0855	163.6905	204.8436
Water transportation	2.0000	1.2075	.1492	.0945	2.4150	3.1932
Other transportation	25.0000	1.1490	.1492	.0945	28.7250	37.9810
Communication	105.0000	1.4346	.2028	.1296	150.6330	225.6336
Electrical, gas, and sanitary Services	91.0000	1.6770	.2492	.1661	152.6070	261.0005
Wholesale trade	329.0000	1.3280	.0479	.2080	436.9120	587.1684
Retail trade	738.0000	1.0580	.0565	.2033	780.8040	1,054.8554
Finance, insurance, and real estate	255.0000	2.7980	.1536	.1912	713.4900	1,088.9652
Services	793.0000	1.0724	.0610	.0314	850.4132	936.9912
Mining	65.0000	1.3364	.1599	.0784	83.2247	109.2617
Coal mining	4.0000	1.5268	.1599	.0784	6.1072	8.0178
Oil and gas extraction	37.0000	1.2492	.1599	.0784	46.2204	60.6806
Metal mining	7.0000	1.2220	.1599	.0784	8.5540	11.2301
Nonmetalic mineral, except fuels	17.0000	1.3143	.1599	.0784	22.3431	29.3332

See footnotes at the end of Table 28.

TABLE 20
Values Added in Construction, Transportation, Service and Mining Sectors, 1975
Arkansas

(Millions of dollars)

Industry	P.I. (1)	U.S. Ratios N.I./P.I. (2)	U.S. Ratios C.C.A./G.N.P. (3)	U.S. Ratios I.B.T/G.N.P. (4)	N.I. (5) [= (1)x(2)]	Value Added by Industry (6) [= (5)/1-(3)-(4)]
Construction	445.0000	1.1175	.0635	.0236	497.2875	544.7338
Transportation and public utilities	516.0000	1.3652	.1811	.1170	717.6506	1,020.2019
Railroad transportation	112.0000	1.1690	.1403	.0526	130.9280	162.2203
Trucking and warehousing	144.0000	1.1388	.1202	.0944	163.9872	208.7945
Water transportation	3.0000	1.1643	.1490	.0962	3.4929	4.6276
Other transportation	26.0000	1.1211	.1490	.0962	29.1486	38.6176
Communication	126.0000	1.4009	.2035	.1231	176.5134	262.1227
Electrical, gas, and sanitary Services	105.0000	2.0341	.2242	.1546	213.5805	343.8192
Wholesale trade	414.0000	1.2616	.0477	.2182	522.3024	711.4867
Retail trade	754.0000	1.1636	.0530	.1934	877.3544	1,164.2176
Finance, insurance, and real estate	277.0000	2.8270	.1513	.1928	783.0790	1,193.9000
Services	892.0000	1.0813	.0603	.0323	964.5196	1,062.9486
Mining	67.0000	1.3489	.1771	.0755	90.3763	120.9209
Coal mining	0.0000[3]	1.3974	.1771	.0755	0.0000	0.0000
Oil and gas extraction	32.0000	1.3968	.1771	.0755	44.6976	59.8041
Metal mining	9.0000	1.0721	.1771	.0755	9.6489	12.9100
Nonmetalic mineral, except fuels	0.0000[3]	1.3067	.1771	.0755	0.0000	0.0000

See footnotes at the end of Table 28.

TABLE 21
Values Added in Construction, Transportation, Service and Mining Sectors, 1976
Arkansas

(Millions of dollars)

Industry	P.I. (1)	U.S. Ratios N.I./P.I. (2)	U.S. Ratios C.C.A./G.N.P. (3)	U.S. Ratios I.B.T/G.N.P. (4)	N.I. (5) [= (1)x(2)]	Value Added by Industry (6) [= (5)/1-(3)-(4)]
Construction	496.0000	1.1093	.0594	.0257	550.2128	601.3912
Transportation and public utilities	583.0000	1.4046	.1717	.1151	830.3327	1,161.3367
Railroad transportation	125.0000	1.2358	.1203	.0526	154.4750	186.7670
Trucking and warehousing	161.0000	1.1528	.1034	.0958	185.6008	231.7692
Water transportation	3.0000	1.1726	.1333	.1000	3.5178	4.5882
Other transportation	31.0000	1.1953	.1333	.1000	37.0543	48.3296
Communication	146.0000	1.4492	.1991	.1172	211.5832	309.4679
Electrical, gas, and sanitary Services	116.0000	2.0526	.2194	.1547	238.1016	380.4148
Wholesale trade	460.0000	1.2855	.0540	.1992	591.3300	791.8184
Retail trade	837.0000	1.1718	.0527	.1957	980.7966	1,304.9449
Finance, insurance, and real estate	331.0000	2.7556	.1438	.1922	912.1036	1,373.6500
Services	996.0000	1.0907	.0573	.0332	1,086.3372	1,194.4334
Mining	89.0000	1.2918	.1891	.0780	114.9702	156.8702
Coal mining	0.0000[3]	1.3221	.1891	.0780	0.0000	0.0000
Oil and gas extraction	0.0000[3]	1.3001	.1891	.0780	0.0000	0.0000
Metal mining	9.0000	1.1678	.1891	.0780	10.5102	14.3406
Nonmetalic mineral, except fuels	0.0000[3]	1.2927	.1891	.0780	0.0000	0.0000

See footnotes at the end of Table 28.

TABLE 22
Values Added in Construction, Transportation, Service and Mining Sectors, 1977
Arkansas

(Millions of dollars)

Industry	P.I. (1)	U.S. Ratios N.I./P.I. (2)	U.S. Ratios C.C.A./G.N.P. (3)	U.S. Ratios I.B.T/G.N.P. (4)	N.I. (5) [= (1)x(2)]	Value Added by Industry (6) [= (5)/1-(3)-(4)]
Construction	598.0000	1.1108	.0560	.0250	664.2584	722.8057
Transportation and public utilities	650.0000	1.4042	.1683	.1138	920.0851	1,279.0570
Railroad transportation	135.0000	1.2150	.1159	.0507	164.0250	196.8142
Trucking and warehousing	184.0000	1.1686	.0915	.0915	215.0224	263.1853
Water transportation	3.0000	1.1999	.1241	.0949	3.5997	4.6091
Other transportation	31.0000	1.2362	.1241	.0949	38.3222	49.0681
Communication	167.0000	1.4426	.2044	.1113	240.9142	352.0593
Electrical, gas, and sanitary Services	128.0000	2.0172	.2175	.1578	258.2016	413.3210
Wholesale trade	502.0000	1.2610	.0576	.2009	633.0220	853.7046
Retail trade	939.0000	1.1916	.0513	.1968	1,118.9124	1,488.1133
Finance, insurance, and real estate	385.0000	2.7481	.1384	.1893	1,058,0185	1,573.7297
Services	1,129.0000	1.1026	.0547	.0338	1,244.8354	1,365.6998
Mining	103.0000	1.2827	.2012	.0744	132.1181	182.3828
Coal mining	0.0000[3]	1.2715	.2012	.0744	0.0000	0.0000
Oil and gas extraction	0.0000[3]	1.3118	.2012	.0744	0.0000	0.0000
Metal mining	10.0000	1.1927	.2012	.0744	11.9270	16.4647
Nonmetalic mineral, except fuels	0.0000[3]	1.2480	.2012	.0744	0.0000	0.0000

See footnotes at the end of Table 28.

TABLE 23
Values Added in Construction, Transportation, Service and Mining Sectors, 1972
U.S.

(Millions of dollars)

Industry	P.I. (1)	N.I. (2)	G.N.P. (3)	CCA (4)	IBT (5)	(6) $\frac{NI}{PI}$ $[=\frac{(2)}{(1)}]$	(7) $\frac{CCA}{GNP}$ $[=\frac{(4)}{(3)}]$	(8) $\frac{IBT}{GNP}$ $[=\frac{(5)}{(3)}]$
Construction	47,023	52,277	56,600	3,000	1,300	1.1117	.0530	.0230
Transportation and public utilities	54,180	74,353	103,600	18,000	12,400	1.3723	.1737	.1197
Railroad transportation	7,400	8,355	10,300	1,600	500	1.1291	.1553	.0485
Trucking and warehousing	13,348	15,492	19,400	2,100	1,800	1.1606	.1082	.0928
Water transportation	2,293	2,480	3,200	500	300	1.0816	.1576	.1030
Other transportation	8,855	10,126	13,300	2,100	1,400	1.1435	.1576	.1030
Communication	13,478	20,311	29,400	5,600	4,100	1.5070	.1905	.1394
Electrical, gas, and sanitary services	8,806	17,589	28,000	6,100	4,300	1.9974	.2178	.1536
Wholesale trade	44,607	54,401	82,400	4,300	20,100	1.2196	.0522	.2439
Retail trade	77,960	90,205	118,800	6,900	21,500	1.1571	.0581	.1810
Finance, insurance, and real estate	40,677	112,493	168,600	24,900	32,800	2.7409	.1477	.1945
Services	113,550	122,344	134,500	8,000	4,100	1.0774	.0595	.0305
Mining	7,251	8,700	18,900	4,700	1,600	1.1998	.2487	.0846
Coal mining	2,102	2,493	5,416	1,347	458	1.1860	.2487	.0846
Oil and gas extraction	2,963	3,563	7,740	1,925	655	1.2025	.2487	.0846
Metal mining	994	1,073	2,331	580	197	1.0795	.2487	.0846
Nonmetalic mineral, except fuels	1,192	1,571	3,413	849	289	1.3180	.2487	.0846

See footnotes at the end of Table 28.

TABLE 24
Values Added in Construction, Transportation, Service and Mining Sectors, 1973
U.S.

(Millions of dollars)

Industry	P.I. (1)	N.I. (2)	G.N.P. (3)	CCA (4)	IBT (5)	(6) $\frac{NI}{PI}$ $[=\frac{(2)}{(1)}]$	(7) $\frac{CCA}{GNP}$ $[=\frac{(4)}{(3)}]$	(8) $\frac{IBT}{GNP}$ $[=\frac{(5)}{(3)}]$
Construction	53,547	59,749	64,700	3,500	1,400	1.1158	.0541	.0216
Transportation and public utilities	61,644	82,463	114,500	19,900	13,300	1.3377	.1738	.1162
Railroad transportation	8,206	9,712	11,500	1,500	500	1.1835	.1304	.0435
Trucking and warehousing	15,467	17,544	21,700	2,300	1,900	1.1343	.1060	.0876
Water transportation	2,493	2,799	3,700	500	400	1.1227	.1436	.1050
Other transportation	9,628	11,001	14,400	2,100	1,500	1.1426	.1436	.1050
Communication	15,635	22,648	32,700	6,500	4,300	1.4485	.1988	.1315
Electrical, gas, and sanitary services	10,215	18,759	30,500	7,000	4,700	1.8364	.2295	.1541
Wholesale trade	50,591	65,737	96,800	4,600	21,900	1.2994	.0475	.2262
Retail trade	86,855	95,846	127,000	7,000	24,100	1.1035	.0551	.1898
Finance, insurance, and real estate	43,414	116,657	177,900	27,200	35,300	2.6871	.1529	.1984
Services	127,548	136,842	150,500	9,200	4,400	1.0729	.0611	.0292
Mining	8,198	10,149	21,400	4,800	1,700	1.2380	.2243	.0794
Coal mining	2,418	2,869	6,050	1,357	481	1.1865	.2243	.0794
Oil and gas extraction	3,226	3,908	8,240	1,848	655	1.2114	.2243	.0794
Metal mining	1,161	1,489	3,140	704	249	1.2825	.2243	.0794
Nonmetalic mineral, except fuels	1,393	1,883	3,970	891	315	1.3518	.2243	.0794

See footnotes at the end of Table 28.

TABLE 25
Values Added in Construction, Transportation, Service and Mining Sectors, 1974
U.S.

(Millions of Dollars)

Industry	P.I. (1)	N.I. (2)	G.N.P. (3)	CCA (4)	IBT (5)	$\frac{NI}{PI}$ (6) $[=\frac{(2)}{(1)}]$	$\frac{CCA}{GNP}$ (7) $[=\frac{(4)}{(3)}]$	$\frac{IBT}{GNP}$ (8) $[=\frac{(5)}{(3)}]$
Construction	56,168	62,233	67,600	3,900	1,500	1.1080	.0577	.0222
Transportation and public utilities	66,591	87,206	122,300	22,300	14,300	1.3096	.1823	.1169
Railroad transportation	8,669	10,139	12,000	1,600	600	1.1696	.1333	.0500
Trucking and warehousing	16,558	18,692	23,400	2,700	2,000	1.1289	.1154	.0855
Water transportation	2,737	3,305	4,300	600	400	1.2075	.1492	.0945
Other transportation	10,541	12,112	15,800	2,400	1,500	1.1490	.1492	.0945
Communication	17,089	24,516	35,500	7,200	4,600	1.4346	.2028	.1296
Electrical, gas, and sanitary services	10,997	18,442	31,300	7,800	5,200	1.6770	.2492	.1661
Wholesale trade	57,709	76,639	110,600	5,300	23,000	1.3280	.0479	.2080
Retail trade	92,941	98,334	132,800	7,500	27,000	1.0580	.0565	.2033
Finance, insurance, and real estate	45,893	128,409	194,600	29,900	37,200	2.7980	.1536	.1912
Services	140,080	150,224	165,700	10,100	5,200	1.0724	.0610	.0314
Mining	11,627	15,539	31,900	5,100	2,500	1.3364	.1599	.0784
Coal mining	3,411	5,208	10,691	1,709	838	1.5268	.1599	.0784
Oil and gas extraction	5,332	6,661	13,674	2,186	1,072	1.2492	.1599	.0784
Metal mining	1,306	1,596	3,276	524	257	1.2220	.1599	.0784
Nonmetalic mineral, except fuels	1,578	2,074	4,258	681	334	1.3143	.1599	.0784

See footnotes at the end of Table 28.

TABLE 26
Values Added in Construction, Transportation, Service and Mining Sectors, 1975
U.S.

(Millions of Dollars)

Industry	P.I. (1)	N.I. (2)	G.N.P. (3)	CCA (4)	IBT (5)	$\frac{NI}{PI}$ (6) $[=\frac{(2)}{(1)}]$	$\frac{CCA}{GNP}$ (7) $[=\frac{(4)}{(3)}]$	$\frac{IBT}{GNP}$ (8) $[=\frac{(5)}{(3)}]$
Construction	55,298	61,795	67,700	4,300	1,600	1.1175	.0635	.0236
Transportation and public utilities	70,191	95,823	134,200	24,300	15,700	1.3652	.1811	.1170
Railroad transportation	8,543	9,987	11,400	1,600	600	1.1690	.1403	.0526
Trucking and warehousing	16,153	18,395	23,300	2,800	2,200	1.1388	.1202	.0944
Water transportation	2,854	3,323	4,300	600	400	1.1643	.1490	.0962
Other transportation	11,373	12,750	16,500	2,500	1,600	1.1211	.1490	.0962
Communication	19,321	27,066	39,800	8,100	4,900	1.4009	.2035	.1231
Electrical, gas, and sanitary services	11,947	24,302	38,800	8,700	6,000	2.0341	.2242	.1546
Wholesale trade	63,856	80,564	117,300	5,600	25,600	1.2616	.0477	.2182
Retail trade	97,684	113,663	151,000	8,000	29,200	1.1636	.0530	.1934
Finance, insurance, and real estate	49,655	140,375	212,100	32,100	40,900	2.8270	.1513	.1928
Services	155,850	168,516	185,800	11,200	6,000	1.0813	.0603	.0323
Mining	13,455	18,149	38,400	6,800	2,900	1.3489	.1771	.0755
Coal mining	4,457	6,228	13,177	2,333	995	1.3974	.1771	.0755
Oil and gas extraction	5,781	8,075	17,085	3,026	1,290	1.3968	.1771	.0755
Metal mining	1,525	1,635	3,459	612	261	1.0721	.1771	.0755
Nonmetalic mineral, except fuels	1,692	2,211	4,678	828	353	1.3067	.1771	.0755

See footnotes at the end of Table 28.

TABLE 27
Values Added in Construction, Transportation, Service and Mining Sectors, 1976
U.S.

(Millions of dollars)

Industry	P.I. (1)	N.I. (2)	G.N.P. (3)	C.C.A. (4)	I.B.T. (5)	(6) $\frac{NI}{PI}$ $[=\frac{(2)}{(1)}]$	(7) $\frac{CCA}{GNP}$ $[=\frac{(4)}{(3)}]$	(8) $\frac{IBT}{GNP}$ $[=\frac{(5)}{(3)}]$
Construction	61,029	67,701	74,000	4,400	1,900	1.1093	.0594	.0257
Transportation and public utilities	78,479	110,230	152,000	26,100	17,500	1.4046	.1717	.1151
Railroad transportation	9,557	11,811	13,300	1,600	700	1.2358	.1203	.0526
Trucking and warehousing	18,180	20,957	26,100	2,700	2,500	1.1528	.1034	.0958
Water transportation	3,116	3,654	4,700	600	500	1.1726	.1333	.1000
Other transportation	12,670	15,145	19,300	2,600	1,900	1.1953	.1333	.1000
Communication	21,689	31,431	45,200	9,000	5,300	1.4492	.1991	.1172
Electrical, gas, and sanitary services	13,267	27,232	43,300	9,500	6,700	2.0526	.2194	.1547
Wholesale trade	69,673	89,563	129,500	7,000	25,800	1.2855	.0540	.1992
Retail trade	107,290	125,727	167,100	8,800	32,700	1.1718	.0527	.1957
Finance, insurance, and real estate	57,289	157,863	235,100	33,800	45,200	2.7556	.1438	.1922
Services	173,164	188,869	207,800	11,900	6,900	1.0907	.0573	.0332
Mining	15,689	20,267	42,300	8,000	3,300	1.2918	.1891	.0780
Coal mining	4,443	5,874	12,260	2,319	956	1.3221	.1891	.0780
Oil and gas extraction	7,870	10,232	21,356	4,039	1,666	1.3001	.1891	.0780
Metal mining	1,627	1,900	3,966	750	309	1.1678	.1891	.0780
Nonmetalic mineral, except fuels	1,749	2,261	4,719	892	368	1.2927	.1891	.0780

See footnotes at the end of Table 28.

TABLE 28
Values Added in Construction, Transportation, Service and Mining Sectors, 1977
U.S.

(Millions of dollars)

Industry	P.I. (1)	N.I. (2)	G.N.P. (3)	CCA (4)	IBT (5)	(6) $\frac{NI}{PI}$ $[=\frac{(2)}{(1)}]$	(7) $\frac{CCA}{GNP}$ $[=\frac{(4)}{(3)}]$	(8) $\frac{IBT}{GNP}$ $[=\frac{(5)}{(3)}]$
Construction	69,525	77,232	84,000	4,700	2,100	1.1108	.0560	.0250
Transportation and public utilities	87,510	122,878	167,000	28,100	19,000	1.4042	.1683	.1138
Railroad transportation	10,337	12,559	13,800	1,600	700	1.2150	.1159	.0507
Trucking and warehousing	20,648	24,129	29,500	2,700	2,700	1.1686	.0915	.0915
Water transportation	3,461	4,153	5,200	600	500	1.1999	.1241	.0949
Other transportation	14,190	17,542	22,200	2,800	2,100	1.2362	.1241	.0949
Communication	24,230	34,955	49,400	10,100	5,500	1.4426	.2044	.1113
Electrical, gas, and sanitary services	14,644	29,540	46,900	10,200	7,400	2.0172	.2175	.1578
Wholesale trade	76,487	96,451	138,900	8,000	27,900	1.2610	.0576	.2009
Retail trade	117,927	140,526	187,000	9,600	36,800	1.1916	.0513	.1968
Finance, insurance, and real estate	64,738	177,909	261,500	36,200	49,500	2.7481	.1384	.1893
Services	193,290	213,129	234,000	12,800	7,900	1.1026	.0547	.0338
Mining	18,070	23,179	49,700	10,000	3,700	1.2827	.2012	.0744
Coal mining	4,946	6,289	13,485	2,713	1,004	1.2715	.2012	.0744
Oil and gas extraction	9,516	12,483	26,766	5,385	1,993	1.3118	.2012	.0744
Metal mining	1,733	2,067	4,432	892	330	1.1927	.2012	.0744
Nonmetalic mineral, except fuels	1,875	2,340	5,017	1,010	374	1.2480	.2012	.0744

Footnotes for Tables 11-28

1. Initials are represented as follows:

   P.I. - Personal Income
   N.I. - National Income Without Capital Consumption Adjustment
   G.N.P. - Gross National Product
   C.C.A. - Capital Consumption Allowances
   I.B.T. - Indirect Business Taxes, etc.

2. Less than $500,000.

3. Not shown to avoid disclosure of confidential information; data are included in totals.

4. Negative

5. Source: U.S. Dept. of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, Survey of Current Business (Washington, D.C.: Government Printing Office).

   Specific issues are as follows:

   Table 11-13; July, 1976, pp. 48-50 and August 1975, pp. 12,17,19.
   Table 14-19; July, 1977, pp. 43-45 and August 1977, pp. 18,25,28.
   Table 20-28; July, 1978, pp. 51-53 and October 1978, pp. 32,37,39.

TABLE 29

Values Added[1] in the Government Sector[2], 1972-77
Oklahoma

(Million Dollars)

	1972	1973	1974	1975	1976	1977
1. Wages and salaries disbursement, federal civilian	611.00	628.00	660.00	702.00	761.00	783.00
2. Wages and salaries disbursement, federal military	307.00	280.00	300.00	306.00	345.00	360.00
3. Wages and salaries disbursement, state and local	798.00	903.00	991.00	1,120.00	1,239.00	1,382.00
4. Supplements to wages and salaries, federal civilian[3]	66.17	72.70	84.31	97.77	113.89	124.58
5. Supplements to wages and salaries, federal military[3]	33.25	32.41	38.32	42.62	51.63	57.28
6. Supplements to wages and salaries, state and local[3]	86.42	104.54	126.60	155.98	185.43	219.89
Gross government product of Oklahoma (1+2+3+4+5+6)	1,901.84	2,020.65	2,200.23	2,424.37	2,695.95	2,926.75

See footnotes at the end of Table 31.

TABLE 30

Values Added[1] in the Government Sector[2], 1972-77

Arkansas

(Million Dollars)

	1972	1973	1974	1975	1976	1977
1. Wages and salareis disbursement, federal civilian	193.00	207.00	229.00	258.00	280.00	294.00
2. Wages and salaries disbursement, federal military	118.00	104.00	123.00	133.00	141.00	142.00
3. Wages and salareis disbursement, state and local	465.00	537.00	603.00	707.00	784.00	864.00
4. Supplements to wages and salaries, federal civilain[3]	20.90	23.96	29.25	35.93	41.91	46.78
5. Supplements to wages and salaries, federal military[3]	12.78	12.04	15.71	18.52	21.10	22.59
6. Supplements to wages and salareis, state and local [3]	50.36	62.17	77.03	98.46	117.34	137.47
Gross government product of Arkansas (1+2+3+4+5+6)	860.04	946.17	1,076.99	1,250.91	1,385.35	1,506.84

See footnote at the end of Table 31.

TABLE 31

Values Added[1] in the Government Sector[2], 1972-77

U.S.

(Million Dollars)

	1972	1973	1974	1975	1976	1977
1. Wages and salaries disbursement, federal civilian	32,951.00	34,848.00	38,175.00	41,780.00	45,079.00	48,180.00
2. Wages and salaries disbursement, federal military	18,573.00	16,810.00	17,642.00	17,906.00	18,352.00	19,035.00
3. Wages and salaries disbursement, state and local	81,798.00	93,097.00	101,510.00	113,392.00	122,661.00	132,255.00
4. Supplements to wages and salaries, federal civilian[3]	3,568.38	4,034.22	4,876.81	5,818.78	6,746.63	7,665.78
5. Supplements to wages and salaries, federal military[3]	2,011.34	1,946.03	2,253.74	2,493.80	2,746.60	3,028.60
6. Supplements to wages and salaries, state and local[3]	8,858.19	10,777.48	12,967.78	15,792.32	18,357.74	21,042.71
Gross government product of U.S. (1+2+3+4+5+6)	147,759.91	161,512.73	177,425.33	197,182.90	213,942.97	231,207.09

Footnotes for Tables 29-31

1. Values Added are based on the amount of Personal Income.

2. Government Sector consists of Government and Government enterprises.

3. Supplements to wages and salaries are calculated, respectively, by multiplying the national ratio (based on the amount of National Income) as follows:

   Supplements to wages and salaries = wages and salaries disbursement X the national ratio, where national ratio = $\frac{\text{national total of supplements to wages and salaries}}{\text{national total of wages and salaries}}$

4. Source: U.S. Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, Survey of Current Business (Washington, D.C.: Government Printing Office).

   Specific issues are as follows:

   1972, July 1976, p. 29 and August 1975, pp. 12, 17, 19.
   1973-74, July 1977, p. 24 and August 1977, pp. 18, 25, 28.
   1975-77, July 1978, p. 31 and October 1978, pp. 32, 37, 39.

TABLE 32

Agricultural Production, 1972-77
Oklahoma

	1972	1973	1974	1975	1976	1977
Wheat (Bushels)	89,700,000	157,800,000	134,400,000	160,800,000	151,200,000	175,500,000
Peanuts (Lbs.)	242,650,000	253,700,000	217,740,000	232,300,000	156,911,600	267,600,000
Sorghum (Bushels)	27,090,000	30,624,000	22,800,000	25,080,000	21,900,000	21,470,000
Cotton (Bales) (480 Lbs.)	332,000	427,000	310,000	170,000	175,000	436,000
Hay (Tons)	2,899,000	3,892,000	3,087,000	3,730,000	3,427,000	3,520,000
Beef Cow (Number)	2,165,000	2,283,000	2,379,000	2,713,000	2,673,000	2,259,000
Milk Cow (Number)	138,000	134,000	126,000	122,000	117,000	116,000

Source: Oklahoma Crop and Livestock Reporting Service, Oklahoma Agriculture.
Specific issues are as follows:
1973, pp. 30-33, 48-59, 64-67, 78-81
1974, pp. 20-23, 32, 36-39, 40-41, 44-45, 56-57
1975, pp. 13-14, 17-18, 26-27, 29-31, 37, 40-41, 45-46
1976, pp. 21-22, 25-26, 30-31, 37-39, 69-70
1977, pp. 22-23, 26-27, 30-31, 34-35, 38-39, 60-61

TABLE 33

Agricultural Production, 1972-77
Arkansas

	1972	1973	1974	1975	1976	1977
Wheat (Bushels)	10,952,000	6,076,000	8,745,000	15,600,000	27,690,000	25,740,000
Rice (Bags) (100 Lbs.)	21,939,000	25,424,000	32,879,000	40,053,000	40,362,000	35,396,000
Sorghum (Bushels)	8,007,000	6,705,000	6,020,000	9,800,000	15,500,000	12,600,000
Cotton (Bales) (480 Lbs.)	1,435,000	1,041,000	880,000	687,000	776,000	1,035,000
Soybean (Bushels)	81,000,000	116,250,000	81,700,000	115,150,000	77,760,000	101,200,000

Source: 1. Arkansas Crop and Livestock Reporting Service
2. Crop Reporting Service, Agricultural Statistics for Arkansas
Specific issues are as follows:
1975, pp. 16-23
1976, pp. 18-25
1977, pp. 18-25

TABLE 34

Cash Receipts by Agricultural Commodities, 1972-77
Oklahoma

(Unit: %)

	1972	1973	1974	1975	1976	1977
Livestock products	77.3	65.8	58.8	57.5	65.9	60.2
Meat animals	69.3	59.3	50.4	49.2	56.6	51.0
Dairy products	5.3	3.8	5.3	4.9	5.7	5.6
Poultry and eggs	2.2	2.4	2.7	2.9	3.1	3.0
Misc. livestock	.5	.3	.4	.5	.5	.5
Crops	22.7	34.2	41.2	42.5	34.1	39.8
Food grains	10.9	21.4	27.0	28.8	20.7	24.2
Feed crops	4.1	3.9	5.5	4.7	4.4	4.5
Cotton	2.8	4.5	3.4	3.0	2.9	3.8
Oil crops	3.1	2.7	3.6	3.6	4.0	4.6
Vegetables	.5	.3	.6	.7	.6	.6
Greenhouse and Nursery	.7	.5	.7	.7	.8	.8
Fruits and nuts	.2	.5	.1	.5	.2	.7
Forest products	*	*	*	*	.1	.1
All other crops	.4	.3	.3	.2	.2	.3

See footnotes at the end of Table 36.

TABLE 35

Cash Receipts by Agricultural Commodities, 1972-77
Arkansas

(Unit: %)

	1972	1973	1974	1975	1976	1977
Livestock products	50.1	47.3	38.3	46.5	44.1	47.5
Meat animals	15.5	12.8	7.0	11.3	9.8	13.8
Dairy products	3.2	2.3	2.7	2.8	2.8	2.9
Poultry and eggs	30.8	31.8	28.1	31.9	30.9	30.3
Misc. livestock	.6	.4	.5	.5	.6	.5
Crops	49.9	52.7	61.7	53.5	55.9	52.5
Food grains	10.9	16.0	18.4	16.6	16.5	16.9
Feed crops	1.3	.9	1.2	1.5	1.3	1.4
Cotton	15.5	10.2	6.0	13.1	11.0	12.1
Oil crops	19.8	23.8	34.2	20.2	25.2	20.3
Vegetables	1.2	.8	.8	.9	.7	.5
Greenhouse and Nursery	.3	.2	.2	.2	.2	.2
Fruits and nuts	.5	.4	.4	.5	.4	.4
Forest products	.4	.4	.4	.3	.4	.4
All other crops	*	.1	.1	*	*	.1

See footnotes at the end of Table 36.

TABLE 36

Cash Receipts by Agricultural Commodities, 1972-77
U.S.

(Unit: %)

	1972	1973	1974	1975	1976	1977
Livestock products	58.2	52.7	44.7	48.8	48.8	49.5
Meat animals	39.1	34.9	27.2	29.2	28.5	29.0
Dairy products	11.6	9.2	10.2	11.2	12.1	12.3
Poultry and eggs	6.9	8.0	6.7	7.7	7.5	7.5
Misc. livestock	.6	.6	.6	.6	.7	.6
Crops	41.8	47.3	55.3	51.2	51.2	50.5
Food grains	5.7	8.2	9.2	8.8	7.3	6.4
Feed crops	9.6	12.2	15.1	13.7	13.8	12.5
Cotton	3.0	3.2	3.1	2.6	3.7	4.1
Oil crops	7.2	8.7	10.8	8.2	9.8	9.8
Vegetables	5.4	5.0	5.8	6.1	5.5	5.9
Greenhouse and nursery	2.0	1.6	1.7	2.1	2.2	2.4
Fruits and nuts	4.2	3.9	3.7	4.0	3.8	4.4
Forest products	.5	.5	.6	.5	.6	.6
Tobacco	2.4	1.8	2.3	2.4	2.4	2.4
All other crops	1.8	2.0	3.0	2.6	1.9	2.0

Footnotes for Tables 34-36

*Less than 0.05 percent

1. Commodities do not add to group totals because minor commodities may not be estimated in all states.

2. Sources of data for the years 1972-74 are as follows:

1972: U.S. Dept. of Agriculture, Economic Research Service, State Farm Income Statistics, Supplement to Statistical Bulletin No. 547, Sep. 1975, pp. 42-43, 46, 71-72.

1973: U.S. Dept. of Agriculture, Economic Research Service, State Farm Income Statistics, Supplement to Statistical Bulletin No. 557, Aug. 1976, pp. 42-43, 46, 70-71.

1974: U.S. Dept. of Agriculture, Economic Research Service, State Farm Income Statistics, Supplement to Statistical Bulletin No. 576, Sep. 1977, pp. 45-46, 49, 73-74.

3. Source of data for the years 1975-77 are as follows:

U.S. Dept. of Agriculture, Economics, Statistics, and Cooperatives Service, State Farm Income Statistics, Supplement to Statistical Bulletin No. 609, Sep. 1978, pp. 49-50, 53, 78.

TABLE 37

Market Value of Agricultural Products Sold, 1974
Oklahoma & Arkansas

(Unit: %)

		Crops & Hay	Nursery & Greenhouse Products	Forest Products	Livestock & Livestock Products	Poultry & Poultry Products
OKLAHOMA	State	100.0	100.0	100.0	100.0	100.0
	Water Counties	5.5	24.4	4.6	9.7	17.1
	Non-Water Counties	94.5	75.6	95.4	90.3	82.9
ARKANSAS	State	100.0	100.0	100.0	100.0	100.0
	Water Counties	21.2	41.5	16.2	23.1	20.0
	Non-Water Counties	78.8	58.5	83.8	76.9	80.0

Source: 1. U.S. Dept. of Commerce, Bureau of The Census, 1974 Census of Agriculture Vol. 1 Part 36 Oklahoma State and County Data, May 1977, pp. II-10-11.

2. U.S. Dept. of Commerce, Bureau of The Census, 1974 Census of Agriculture Vol. 1 Part 4 Arkansas State and County Data, April 1977, pp. II-10-11.

TABLE 38

Ratios of Agricultural Production in Water Region to State, 1972-77
Oklahoma

	1972			1973			1974		
	State	Water County	%	State	Water County	%	State	Water County	%
Wheat (Bushels)	89,700,000	2,437,300	2.72	157,800,000	2,574,400	1.63	134,400,000	2,914,600	2.17
Peanut (Lbs.)	242,650,000	7,031,800	2.90	253,700,000	7,065,200	2.78	217,740,000	7,498,900	3.44
Sorghum (Bushels)	27,090,000	1,036,000	3.82	30,624,000	1,457,400	4.76	22,800,000	1,076,880	4.72
Cotton (Bales) (480 Lbs.)	332,000	9,646	2.90	427,000	5,496	1.29	310,000	3,764	1.21
Hay (Tons)	2,899,000	452,900	15.62	3,892,000	655,610	16.84	3,087,000	538,530	17.44
Beef Cow (Number)	2,165,000	425,300	19.64	2,283,000	452,250	19.81	2,379,000	468,250	19.68
Milk Cow (Number)	138,000	19,150	13.88	134,000	18,150	13.54	126,000	15,550	12.34

Source: Oklahoma Crop and Livestock Reporting Service, Oklahoma Agriculture.
Specific issues are as follows:
1973, pp. 30-33, 48-59, 64-67, 78-81
1974, pp. 20-23, 32, 36-39, 40-41, 44-45, 56-57
1975, pp. 13-14, 17-18, 26-27, 29-31, 37, 40-41, 45-46
1976, pp. 21-22, 25-26, 30-31, 37-39, 69-70
1977, pp. 22-23, 26-27, 30-31, 34-35, 38-39, 60-61

TABLE 38 (Continued)

	1975			1976			1977		
	State	Water County	%	State	Water County	%	State	Water County	%
Wheat (Bushels)	160,800,000	2,842,500	1.77	151,200,000	4,617,500	3.05	175,500,000	4,375,800	2.49
Peanut (Lbs.)	232,300,000	9,363,100	4.03	156,911,600	1,036,000	0.66	267,600,000	12,490,000	4.67
Sorghum (Bushels)	25,080,000	1,392,540	5.55	21,900,000	1,725,100	7.88	21,470,000	1,286,000	5.99
Cotton (Bales) (480 Lbs.)	170,000	760	0.45	175,000	856	0.49	436,000	1,865	0.43
Hay (Tons)	3,730,000	693,500	18.59	3,427,000	578,600	16.88	3,520,000	602,700	17.12
Beef Cow (Number)	2,713,000	545,550	20.11	2,673,000	563,500	21.08	2,259,000	492,500	21.80
Milk Cow (Number)	122,000	14,950	12.25	117,000	13,300	11.37	116,000	10,550	9.09

TABLE 39

Ratios of Agricultural Production in Water Region to State, 1972-77
Arkansas

	1972			1973			1974		
	State	Water County	%	State	Water County	%	State	Water County	%
Wheat (Bushels)	10,952,000	870,520	7.95	6,076,000	813,100	13.38	8,745,000	790,000	9.03
Rice (Bags) (100 Lbs.)	21,939,000	6,126,100	27.92	25,424,000	7,173,700	28.22	32,879,000	8,044,700	24.47
Sorghum (Bushels)	8,007,000	1,155,600	14.43	6,705,000	1,024,000	15.27	6,020,000	770,200	12.79
Cotton (Bales) (480 Lbs.)	1,435,000	275,800	19.22	1,041,000	244,400	23.48	880,000	193,700	22.01
Soybean (Bushels)	81,000,000	15,989,500	19.74	116,250,000	19,221,600	16.53	81,700,000	13,303,000	16.28

Source: 1. Arkansas Crop and Livestock Reporting Service
2. Crop Reporting Service, Agricultural Statistics for Arkansas
Specific issues are as follows:
1975, pp. 16-23
1976, pp. 18-25
1977, pp. 18-25

TABLE 39 (Continued)

	1975			1976			1977		
	State	Water County	%	State	Water County	%	State	Water County	%
Wheat (Bushels)	15,600,000	1,553,000	9.96	27,690,000	2,248,600	8.12	25,740,000	1,609,600	6.25
Rice (Bags) (100 Lbs.)	40,053,000	9,524,000	23.78	40,362,000	9,360,000	23.19	35,396,000	7,302,500	20.63
Sorghum (Bushels)	9,800,000	1,140,200	11.63	15,500,000	2,127,800	13.73	12,600,000	917,700	7.28
Cotton (Bales) (480 Lbs.)	687,000	161,060	23.44	776,000	208,700	26.89	1,035,000	252,470	24.39
Soybean (Bushels)	115,150,000	19,121,600	16.61	77,760,000	14,674,000	18.87	101,200,000	17,788,100	17.58

TABLE 40

1972 Ratios of Employment and Wages
in Water Region to the State
Oklahoma

Sic	Industry	Employment		Wage	
		Water	No-Water	Water	No-Water
07--	Agricultural Services, Forestry, Fisheries	0.263393	0.736607	0.230303	0.769697
0700	Agriculture Services and Hunting	0.103933	0.896067	0.075121	0.924879
10--	Mining	0.340331	0.659669	0.380379	0.619621
1300	Oil and Gas Extraction	0.280277	0.719723	0.308387	0.691613
1400	Nonmetallic Minerals, Except Fuels	0.0	1.000000	0.0	1.000000
15--	Contract Construction	0.313187	0.686813	0.327935	0.672065
1500	General Building Contractors	0.268307	0.731693	0.251312	0.748688
1600	Heavy Construction Contractors	0.305521	0.694470	0.343548	0.656452
1700	Special Trade Contractors	0.344496	0.655504	0.373434	0.626566
19--	Manufacturing	0.376233	0.623767	0.382537	0.617463
2000	Food and Kindred Products	0.291978	0.708022	0.273079	0.726921
2200	Textile Mill Products	0.0	1.000000	0.0	1.000000
2300	Apparel and Other Textile Products	0.346692	0.654408	0.330417	0.669583
2400	Lumber and Wood Products	0.099404	0.900596	0.073035	0.926965
2500	Furniture and Fixtures	0.475292	0.524708	0.488837	0.511163
2600	Paper and Allied Products	0.0	1.000000	0.0	1.000000
2700	Printing and Publishing	0.360215	0.639785	0.383146	0.616854
2800	Chemicals and Allied Products	0.283682	0.716318	0.274878	0.725122
2900	Petroleum and Coal Products	0.730094	0.269906	0.754413	0.245587
3000	Rubber and Plastics Products, NEC	0.402145	0.597855	0.388496	0.611504
3100	Leather and Leather Products	0.0	1.000000	0.0	1.000000
3200	Stone, Clay and Glass Products	0.417290	0.582710	0.400883	0.599117
3300	Primary Metal Industries	0.917445	0.082555	0.934807	0.065193
3400	Fabricated Metal Products	0.646094	0.353906	0.665251	0.334749
3500	Machinery, Except Electrical	0.551396	0.448604	0.544149	0.228193
3600	Electrical Equipment and Supplies	1.000000	0.0	1.000000	0.0
3700	Transportation Equipment	0.489027	0.510973	0.576154	0.423846
3800	Instruments and Related Products	0.749487	0.250513	0.759848	0.240152
3900	Miscellaneous Manufacturing Industries	0.714118	0.285882	0.774893	0.225107
40--	Transportation and Other Public Utilities	0.409460	0.590540	0.438158	0.561842
4100	Local and Interurban Passenger Transit	0.357262	0.642738	0.472823	0.527177

TABLE 40 (Continued)

Sic	Industry	Employment		Wage	
		Water	No-Water	Water	No-Water
4200	Trucking and Warehousing	0.289023	0.710977	0.250531	0.749469
4400	Water Transportation				
4500	Transportation by Air				
4600	Pipe Line Transportation	0.723697	0.276303	0.757375	0.242625
4700	Transportation Services	0.483945	0.516055	0.461180	0.538820
4800	Communication	0.378271	0.621729	0.365908	0.634092
4900	Electric, Gas and Sanitary Service	0.395316	0.604684	0.405817	0.594183
50--	Wholesale Trade	0.356245	0.643755	0.377091	0.622909
52--	Retail Trade	0.296713	0.703287	0.324420	0.675580
5200	Building Materials and Farm Equipment	0.272338	0.727662	0.305999	0.694001
5300	General Merchandise	0.298240	0.701760	0.312436	0.687564
5400	Food Stores	0.314566	0.685434	0.351748	0.648252
5500	Automotive Dealers and Service Stations	0.322012	0.677988	0.337588	0.662412
5600	Apparel and Accessory Stores	0.305514	0.694486	0.325046	0.674954
5700	Furniture and Home Furnishings Stores	0.330486	0.669514	0.345279	0.654721
5800	Eating and Drinking Places	0.257054	0.742946	0.264669	0.735331
5900	Miscellaneous Retail Stores	0.295738	0.704262	0.327315	0.672685
60--	Finance, Insurance and Real Estate	0.318577	0.681423	0.323652	0.676348
6000	Banking	0.319652	0.680348	0.317195	0.682805
6100	Credit Agencies Other Than Banks	0.296792	0.703208	0.299079	0.700921
6200	Security, Commodity Brokers and Services				
6300	Insurance Carriers	0.317820	0.682180	0.319044	0.680956
6400	Insurance Agents, Brokers and Services	0.283966	0.716034	0.320283	0.679717
6500	Real Estate	0.341621	0.658379	0.359159	0.640841
6700	Holding and Other Investment Companies	0.359434	0.640566	0.408918	0.591082
70--	Services	0.330746	0.669254	0.361670	0.638330
7000	Hotels and Other Lodging Places	0.331341	0.668659	0.360530	0.639470
7200	Personal Services	0.326134	0.673866	0.345431	0.654569
7300	Miscellaneous Business Services	0.402578	0.597422	0.413588	0.586412
7500	Auto Repair, Services and Garages	0.310851	0.689149	0.332995	0.667005
7600	Miscellaneous Repair Services	0.253015	0.746985	0.263223	0.736777
7800	Motion Pictures	0.294643	0.705357	0.368483	0.631517
7900	Amusement and Recreation Services, NEC	0.394279	0.605721	0.430846	0.569154
8000	Medical and Other Health	0.333842	0.666158	0.358767	0.641233

TABLE 40 (Continued)

Sic	Industry	Employment		Wage	
		Water	No-Water	Water	No-Water
8100	Legal Services	0.338061	0.661939	0.349383	0.650617
8200	Education Services	0.498757	0.501243	0.590786	0.409214
8600	Nonprofit Membership Organizations	0.285799	0.714201	0.334967	0.665033
8900	Miscellaneous Services	0.376991	0.623009	0.435836	0.564164
99--	Unclassified Establishment	0.347709	0.652291	0.379023	0.620977
	Total	0.337196	0.662894	0.366358	0.633642

TABLE 41

1972 Ratios of Employment and Wages
in Water Region to the State
Arkansas

Sic	Industry	Employment		Wage	
		Water	No-Water	Water	No-Water
07--	Agricultural Services, Forestry, Fisheries	0.308129	0.691871	0.329883	0.670117
0700	Agriculture Services and Hunting	0.191244	0.808756	0.170588	0.829412
10--	Mining	0.236509	0.763491	0.254649	0.745351
1200	Bituminous Coal and Lignite Mining				
1300	Oil and Gas Extraction	0.314583	0.685417	0.285305	0.714695
1400	Nonmetallic Minerals, Except Fuels	0.500000	0.500000	0.531222	0.468778
15--	Contract Construction	0.599104	0.400896	0.669043	0.330957
1500	General Building Contractors	0.601111	0.398889	0.668470	0.331530
1600	Heavy Construction Contractors	0.472333	0.527667	0.520848	0.479152
1700	Special Trade Contractors	0.618146	0.381854	0.695891	0.304109
1900	Manufacturing	0.425244	0.574756	0.433090	0.566910
2000	Food and Kindred Products	0.572603	0.427397	0.590979	0.409021
2300	Apparel and Other Textile Products				
2400	Lumber and Wood Products	0.249297	0.750703	0.244761	0.755239
2500	Furniture and Fixtures				
2600	Paper and Allied Products				
2700	Printing and Publishing	0.690609	0.309391	0.701149	0.298851
2800	Chemical and Allied Products	0.151023	0.848977	0.093378	0.906622
3000	Rubber and Plastics Products, NEC				
3200	Stone, Clay and Glass Products	0.652174	0.347826	0.719047	0.280953
3300	Primary Metal Industries				
3400	Fabricated Metal Products	0.735055	0.264945	0.778503	0.221497
3500	Machinery, Except Electrical	0.645497	0.354503	0.650231	0.349769
3600	Electrical Equipment and Supplies	0.841297	0.158703	0.837088	0.162912
3700	Transportation Equipment	0.955767	0.044233	0.962453	0.037547
3900	Miscellaneous Manufacturing Industries	0.980427	0.019573	0.993548	0.006452
40--	Transportation and Other Public Utilities	0.520683	0.479317	0.554036	0.445964
4100	Local and Interurban Passenger Transit	0.838624	0.161376	0.900783	0.099217
4200	Trucking and Warehousing	0.491533	0.508467	0.535507	0.464493

TABLE 41 (Continued)

Sic	Industry	Employment		Wage	
		Water	No-Water	Water	No-Water
4400	Water Transportation	0.937198	0.062802	0.971377	0.028623
4500	Transportation by Air	0.438776	0.561224	0.397059	0.602941
4700	Transportation Services	0.743730	0.256270	0.763023	0.236977
4800	Communication	0.560250	0.439750	0.559776	0.440224
4900	Electric, Gas and Sanitary Service	0.634342	0.365658	0.693011	0.306989
50--	Wholesale Trade	0.458362	0.541638	0.489896	0.510104
52--	Retail Trade	0.350301	0.649699	0.354705	0.645295
5200	Building Materials and Farm Equipment	0.543658	0.456342	0.592649	0.407351
5300	General Merchandise	0.421905	0.578095	0.443213	0.556787
5400	Food Stores	0.449108	0.550892	0.488533	0.511467
5500	Automotive Dealers and Service Stations	0.477759	0.522241	0.523512	0.476488
5600	Apparel and Accessory Stores	0.544218	0.455782	0.576319	0.423681
5700	Furniture and Home Furnishing Stores	0.474212	0.525788	0.514640	0.485360
5800	Eating and Drinking Places	0.394884	0.605116	0.396313	0.603687
5900	Miscellaneous Retail Stores	0.597809	0.402191	0.652961	0.347039
60--	Finance, Insurance and Real Estate	0.538382	0.461618	0.566072	0.433928
6000	Banking	0.763303	0.236697	0.781250	0.218750
6100	Credit Agencies Other Than Banks				
6200	Security, Commodity Brokers and Services	0.879833	0.120167	0.864218	0.135782
6300	Insurance Carriers	0.572276	0.427724	0.651762	0.348238
6400	Insurance Agents, Brokers and Service	0.517288	0.482712	0.548007	0.451993
6500	Real Estate	0.878453	0.121547	0.868613	0.131387
6600	Combined Real Estate, Insurance, Etc.	0.813333	0.186667	0.907407	0.092593
6700	Holding and Other Investment Companies	0.534157	0.465843	0.572968	0.427032
70--	Services	0.348458	0.651542	0.366712	0.633288
7000	Hotels and Other Lodging Places	0.497989	0.502011	0.524959	0.475041
7200	Personal Services	0.802857	0.197143	9.815077	0.184923
7300	Miscellaneous Business Services	0.587535	0.412465	0.630810	0.369190
7500	Auto Repair, Services and Garages	0.657241	0.342759	0.659202	0.340798
7600	Miscellaneous Repair Services	0.390323	0.609677	0.450000	0.550000
7800	Motion Pictures	0.363869	0.636131	0.346984	0.653016
7900	Amusement and Recreation Services, NEC				

TABLE 41 (Continued)

Sic	Industry	Employment		Wage	
		Water	No-Water	Water	No-Water
8000	Medical and Other Health Services	0.543303	0.456697	0.580315	0.419685
8100	Legal Services	0.506981	0.493019	0.592832	0.407168
8200	Educational Services	0.753792	0.246208	0.792887	0.207113
8600	Nonprofit Membership Organizations	0.592978	0.407022	0.602722	0.397278
8900	Miscellaneous Services	0.681412	0.318588	0.757060	0.242940
99--	Unclassified	0.564881	0.435119	0.633838	0.366162
	Total	0.483513	0.516487	0.513670	0.486330

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